

# THE ASTROPHYSICAL JOURNAL

## 1991 AUTHOR INDEX

- AQUIST, O. B. High-Resolution Radio Continuum Observations of Compact Planetary Nebulae. *O. B. Aquist & Sun Kwok*. 378, 599, 159-G1 (1991)
- ABDALLAH, J., JR. Integral and Differential Cross Sections for Electron Impact Ionization. *R. E. H. Clark, J. Abdallah, Jr., & J. B. Mann*. 381, 597, 198-B9 (1991)
- ABRAHAMS, ANDREW M. Equation of State in a Strong Magnetic Field: Finite Temperature and Gradient Corrections. *Andrew M. Abrahams & Stuart L. Shapiro*. 374, 652, 107-B12 (1991)
- Equation of State in Metals and Cold Stars: Evaluation of Statistical Models. *Dong Lai, Andrew M. Abrahams, & Stuart L. Shapiro*. 377, 612, 147-C10 (1991)
- Molecules and Chains in a Strong Magnetic Field: Statistical Treatment. *Andrew M. Abrahams & Stuart L. Shapiro*. 382, 233, 203-B5 (1991)
- ABRAMOWICZ, MAREK A. The Appearance of Highly Relativistic, Spherically Symmetric Stellar Winds. *Marek A. Abramowicz, Igor D. Novikov, & Bohdan Paczyński*. 369, 175, 38-B5 (1991)
- ABT, HELMUT A. Editorial: Changes to the Volume Index. *Helmut A. Abt*. 366, 341, 7-B1 (1991)
- Spectroscopic Binaries in the Orion Nebula Cluster. *Helmut A. Abt, Ruyu Wang, & Octavio Cardona*. 367, 155, 14-A1 (1991)
- Reinvestigation of the Binary Frequency in the Open Cluster IC 4665. *Nidia Morrell & Helmut A. Abt*. 378, 157, 153-A1 (1991)
- Announcements: 1992 Rates and Supplement Volumes. *Helmut A. Abt*. 381, 1, 189-A1 (1991)
- ACHILLEOS, N. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- ACHTERMAN, J. M. Discovery of Interstellar Methane: Observations of Gaseous and Solid CH<sub>4</sub> Absorption toward Young Stars in Molecular Clouds. *J. H. Lacy, J. S. Carr, Neal J. Evans II, F. Baas, J. M. Achtermann, & J. F. Arens*. 376, 556, 133-C9 (1991)
- A Gaseous Tail Ablated from the Supergiant IRS 7 near the Galactic Center. *E. Serabyn, J. H. Lacy, & J. M. Achtermann*. 378, 557, 159-C9 (1991)
- Galactic Center Gasdynamics: A One-armed Spiral in a Keplerian Disk. *J. H. Lacy, J. M. Achtermann, & E. Serabyn*. 380, L71, 188-D6 (1991)
- ACHTERMAN, JEFFREY M. Detection of Low-J Pure-Rotational Emission from H<sub>2</sub> in the Orion Bar Region: Evidence for Small-Scale Clumpiness. *Parvinder S. Parmar, John H. Lacy, & Jeffrey M. Achterman*. 372, L25, 79-D1 (1991)
- ACTON, L. W. The O VII Soft X-Ray Spectrum and Its Application to Hot Plasmas in Astrophysics. *A. H. Gabriel, F. Bely-Dubau, P. Faucher, & L. W. Acton*. 378, 438, 156-D1 (1991)
- ADAMOWICZ, LUDWIK. Theoretical Vibrations of Carbon Chains C<sub>3</sub>, C<sub>4</sub>, C<sub>5</sub>, C<sub>6</sub>, C<sub>7</sub>, C<sub>8</sub>, and C<sub>9</sub>. *Joe Kurtz & Ludwik Adamowicz*. 370, 784, 58-C5 (1991)
- ADAMS, FRED C. Asymptotic Theory for the Spatial Distribution of Protostellar Emission. *Fred C. Adams*. 382, 544, 208-C8 (1991)
- Far-Infrared and Submillimeter Wavelength Observations of Star-forming Dense Cores. II. Images. *E. F. Ladd, Fred C. Adams, S. Casey, J. A. Davidson, G. A. Fuller, D. A. Harper, P. C. Myers, & R. Padman*. 382, 555, 208-D7 (1991)
- ADAMS, J. H., JR. The Charge State of the Anomalous Component of Cosmic Rays. *J. H. Adams, Jr., M. Garcia-Munoz, N. L. Grigorov, B. Klecker, M. A. Kondratyeva, G. M. Mason, R. E. McGuire, R. A. Mewaldt, M. I. Panasyuk, Ch. A. Tretyakova, A. J. Tylka, & D. A. Zhuravlev*. 375, L45, 124-B6 (1991)
- ADAMS, JAMES H., JR. The Charge State of the Anomalous Component: Results from the Trapped Ions in Space Experiment. *James H. Adams, Jr., Lorraine P. Beahm, & Allan J. Tylka*. 377, 292, 141-E9 (1991)
- ADARKAR, H. Search for High-Energy Neutrinos from Celestial Sources in the Kolar Gold Fields Experiment. *H. Adarkar, S. R. Dugad, Y. Hayashi, N. Ito, S. Kawakami, M. R. Krishnaswamy, M. G. K. Menon, S. Miyake, N. K. Mondal, T. Nakamura, V. S. Narasimham, B. V. Sreekanthan, & K. Tanaka*. 380, 235, 179-A1 (1991)
- ADELMAN, SAUL J. Metallic Line Profiles of the A0 V Star Vega. *Austin F. Gulliver, Saul J. Adelman, Charles R. Cowley, & J. Murray Fletcher*. 380, 223, 178-G1 (1991)
- ADLER, DAVID S. The Relationship between the Carbon Monoxide Intensity and the Radio Continuum Emission in Spiral Galaxies. *David S. Adler, Ronald J. Allen, & K. Y. Lo*. 382, 475, 207-D12 (1991)
- ADORF, H.-M. Properties of the SN 1987A Circumstellar Ring and the Distance to the Large Magellanic Cloud. *N. Panagia, R. Gilmozzi, F. Macchietto, H.-M. Adorf, & R. P. Kirshner*. 380, L23, 181-D1 (1991)
- AGGARWAL, K. M. Ne v in Planetary Nebulae. *F. P. Keenan, V. M. Burke, & K. M. Aggarwal*. 371, 636, 69-D13 (1991)
- Effective Collision Strengths among Fine-Structure Levels of Ca xv: Erratum. *K. M. Aggarwal, K. A. Berrington, & F. P. Keenan*. 77, 441, 50-F1 (1991)
- AGGARWAL, KANTI M. Collision Strengths and Excitation Rate Coefficients for Transitions in Fe XXI. *Kanti M. Aggarwal*. 77, 677, 54-A1 (1991)
- AGLIETTA, M. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector. *M. Aglietta, G. Badino, G. Bologna, C. Castagnoli, A. Castellina, V. L. Dadykin, W. Fulgione, P. Galeotti, F. F. Kalchukov, I. V. Korolkova, P. V. Korichaguin, V. A. Kudryavtsev, A. S. Malguin, L. Periale, V. G. Ryassny, O. G. Ryazhskaya, O. Saavedra, G. Trinchero, S. Vernetto, V. F. Yakushev, & G. T. Zatsepin*. 382, 344, 204-D9 (1991)
- AGRAWAL, P. C. Spin-up of the White Dwarf in the Intermediate Polar 3A 0729+103. *Jyoti Singh, P. C. Agrawal, K. M. V. Apparao, P. Vivekananda Rao, & M. B. K. Sarma*. 380, 208, 178-E11 (1991)
- AGRINIER, B. See MASSARO, E., et al. Detection of a Feature at 0.44 MeV in the Crab Pulsar Spectrum with FIGARO II: A Redshifted Positron Annihilation Line?
- AGUIRREGABIRIA, J. M. The Effects of Thermal Radiation on Some General Relativistic Stellar Models. *J. M. Aguirregabiria, J. Ibáñez, A. Di Prisco, & L. Herrera*. 376, 662, 134-E8 (1991)
- AHARONIAN, F. A. A Model of Pulsed Gamma Radiation from the X-Ray Binary Hercules X-1/HZ Herculis. *F. A. Aharonian & A. M. Aloyan*. 381, 220, 191-F8 (1991)
- AHRENS, THOMAS J. Ablation of Silicate Particles in High-Speed Continuum and Transition Flow with Application to the Collection of Interplanetary Dust Particles. *Aaron J. Rulison, Richard C. Flagan, Thomas J. Ahrens, & Wayne F. Miller*. 371, 432, 65-E5 (1991)
- AI, GUOXIANG. Motions, Fields, and Flares in the 1989 March Active Region. *Haimin Wang, Frances Tang, Harold Zirin, & Guoxiang Ai*. 380, 282, 179-E1 (1991)
- AIKAWA, TOSHIKI. Hydrodynamic Pulsation Models of Yellow Super-giant Stars in the Post-Asymptotic Giant Branch. *Toshiaki Aikawa*. 374, 700, 107-F13 (1991)
- AITKEN, DAVID K. Polarimetric Imaging of the Galactic Center at 12.4 Microns: The Detailed Magnetic Field Structure in the Northern Arm and East-West Bar. *David K. Aitken, Daniel Gezari, Craig H. Smith, Mark McCaughey, & Patrick F. Roche*. 380, 419, 183-D10 (1991)
- AJELLO, J. M. Collisional Excitation and Radiative Properties of N II: The Strong Intercombination ( $^1D - ^3P^0$ ) Transition at 748 Å. *T. M.*

- Tripp, D. E. Shemansky, G. K. James, & J. M. Ajello. 368, 641, 33-B6 (1991)
- Cross Sections for Production of H(2p, 2s, 1s) by Electron Collisional Dissociation of H<sub>2</sub>. J. M. Ajello, D. E. Shemansky, & G. K. James. 371, 422, 65-D5 (1991)
- AKE, THOMAS B. First Results from the Goddard High-Resolution Spectrograph: The Chromosphere of  $\alpha$  Tauri. Kenneth G. Carpenter, Richard D. Robinson, Glenn M. Wahlgren, Thomas B. Ake, Dennis C. Ebbets, Jeffrey L. Linsky, Alexander Brown, & Frederick M. Walter. 377, L45, 143-E11 (1991)
- AKE, THOMAS B., III. An Interactive Companion to the S Star HD 35155. Thomas B. Ake III, Hollis R. Johnson, & Mudhaffer M. Ameen. 383, 842, 224-F7 (1991)
- AKERLOF, C. W. Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy. C. W. Akerlof, M. F. Cawley, M. Chantell, D. J. Fegan, K. Harris, A. M. Hillas, D. G. Jennings, R. C. Lamb, M. A. Lawrence, M. J. Lang, D. A. Lewis, D. I. Meyer, G. Mohanty, K. S. O'Flaherty, M. Punch, P. T. Reynolds, M. S. Schubnell, T. C. Weekes, & T. Whitaker. 377, L97, 150-E6 (1991)
- ALBRECHT, R. See MACCHETTO, F., et al. First Results from the Faint Object Camera: Observations of PKS 0521-36.
- See CRANE, P., et al. First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305.
- See JAKORSEN, P., et al. First Results from the Faint Object Camera: SN 1987A.
- See PARESCHE, F., et al. First Results from the Faint Object Camera: Imaging the Core of R Aquarii.
- See MACCHETTO, F., et al. HST Observations of 3C 66B: A Double-stranded Optical Jet.
- First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System. R. Albrecht, C. Barbieri, J. C. Blades, A. Boksenberg, P. Crane, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kamperman, I. R. King, F. Macchetto, C. D. Mackay, F. Paresce, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, & W. B. Sparks. 374, L65, 110-E5 (1991)
- See WEIGELT, G., et al. First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.
- ALCOCK, CHARLES. See GRIEST, KIM, et al. Gravitational Microlensing as a Method of Detecting Disk Dark Matter and Faint Disk Stars.
- ALEXANDER, S. G. Magnetic Two-Photon Scattering and Two-Photon Emission: Cross Sections and Redistribution Functions. S. G. Alexander & P. Mészáros. 372, 554, 82-E11 (1991)
- Cyclotron Harmonics in Accreting Pulsars and Gamma-Ray Bursters: Effect of Two-Photon Processes. S. G. Alexander & P. Mészáros. 372, 565, 82-F9 (1991)
- Radiative Widening and Splitting of Cyclotron Lines in Superstrong Magnetic Fields. G. G. Pavlov, V. G. Bezhastanov, P. Mészáros, & S. G. Alexander. 380, 541, 185-A1 (1991)
- ALEXANDREAS, D. E. A Search of the Northern Sky for Ultra-High-Energy Point Sources. D. E. Andreas, D. Berley, S. Biller, R. L. Burnam, D. R. Cadby, C. Y. Chang, B. L. Dingus, C. L. Dion, G. M. Dion, R. W. Ellsworth, S. J. Freedman, B. K. Fujikawa, J. A. Goodman, T. J. Haines, C. M. Hoffman, D. A. Krakauer, P. W. Kwok, X-Q Lu, D. E. Nagle, M. Potter, V. D. Sandberg, C. Sinnis, M. J. Stark, P. R. Vishwanath, G. B. Yodh, & W. P. Zhang. 383, L53, 226-C11 (1991)
- ALFARO, EMILIO J. Topography of the Galactic Disk: Z-Structure and Large-Scale Star Formation. Emilio J. Alfaro, Jesús Cabrera-Caño, & Antonio J. Delgado. 378, 106, 152-C10 (1991)
- ALFRED, AMY. Period Changes and Evolution in RV Tauri Stars. John R. Percy, Dimitar D. Sasselov, Amy Alfred, & Greg Scott. 375, 691, 121-C7 (1991)
- ALI, B. Absolute Far-Ultraviolet Spectrophotometry of Hot Subluminous Stars from Voyager. J. B. Holberg, B. Ali, T. E. Carone, & R. S. Polidan. 375, 716, 121-E11 (1991)
- ALIMI, J.-M. Precollapse Scale Invariance in Gravitational Instability. F. Moutarde, J.-M. Alimi, F. R. Bouchet, R. Pellat, & A. Ramani. 382, 377, 206-C5 (1991)
- ALIMI, JEAN-MICHEL. Northern Dwarf and Low Surface Brightness Galaxies. IV. The Large-Scale Space Distribution. Trinh X. Thuan, Jean-Michel Alimi, J. Richard Gott III, & Stephen E. Schneider. 370, 25, 47-D1 (1991)
- ALLAMANDOLA, L. J. The Interstellar C-H Stretching Band near 3.4 Microns: Constraints on the Composition of Organic Material in the Diffuse Interstellar Medium. S. A. Sandford, L. J. Allamandola, A. G. G. M. Tielens, K. Sellgren, M. Tapia, & Y. Pendleton. 371, 607, 69-B1 (1991)
- ALLEN, C. K. R Aquarii: H $\alpha$  Map of Subarcsecond Inner Structure. E. K. Hege, C. K. Allen, & W. J. Cocke. 381, 543, 197-D6 (1991)
- ALLEN, M. Formaldehyde in Envelopes of Interstellar Dark Clouds. S. R. Federman & M. Allen. 375, 157, 113-A1 (1991)
- ALLEN, R. J. Polarized Radio Emission from the Edge-on Spiral Galaxies NGC 891 and NGC 4565. S. Sukumar & R. J. Allen. 382, 100, 201-D1 (1991)
- ALLEN, RONALD J. The Relationship between the Carbon Monoxide Intensity and the Radio Continuum Emission in Spiral Galaxies. David S. Adler, Ronald J. Allen, & K. Y. Lo. 382, 475, 207-D12 (1991)
- ALLER, H. D. Synchrotron Emission from Shocked Relativistic Jets. III. Models for the Centimeter Wave Band Quiescent and Burst Emission from 3C 279 and OT 081. P. A. Hughes, H. D. Aller, & M. F. Aller. 374, 57, 98-F5 (1991)
- See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- ALLER, HUGH D. Multifrequency VLA, VLBI, and Single-Dish Observations of the Quasar 4C 39.25. Alan P. Marscher, Yun Fei Zhang, David B. Shaffer, Hugh D. Aller, & Margo F. Aller. 371, 491, 67-E12 (1991)
- ALLER, M. F. Synchrotron Emission from Shocked Relativistic Jets. III. Models for the Centimeter Wave Band Quiescent and Burst Emission from 3C 279 and OT 081. P. A. Hughes, H. D. Aller, & M. F. Aller. 374, 57, 98-F5 (1991)
- See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- ALLER, MARGO F. Multifrequency VLA, VLBI, and Single-Dish Observations of the Quasar 4C 39.25. Alan P. Marscher, Yun Fei Zhang, David B. Shaffer, Hugh D. Aller, & Margo F. Aller. 371, 491, 67-E12 (1991)
- ALLWRIGHT, J. W. B. Multicolor CCD Photometry of Globular Clusters in Two Virgo Elliptical Galaxies. Jean Couture, William E. Harris, & J. W. B. Allwright. 372, 97, 75-C1 (1991)
- The Luminosity Distribution of Globular Clusters in Three Giant Virgo Ellipticals. William E. Harris, J. W. B. Allwright, Christopher J. Prieditis, & Sidney van den Berg. 76, 115, 25-D11 (1991)
- ALMOZNINO, E. See MAOZ, D., et al. High-Rate Active Galaxy Monitoring at the Wise Observatory. III. The Broad-Line Region of NGC 4151.
- ALTNER, B. Rotational Modulation in IUE Spectra of Cool Dwarf Chromospheres. I. Data Analysis and Period Search Techniques. K. L. Hallam, B. Altner, & A. S. Endal. 372, 610, 83-C1 (1991)
- See HEAP, S. R., et al. First Results from the Goddard High-Resolution Spectrograph: Spectroscopic Determination of Stellar Parameters of Melnick 42, an O3F Star in the Large Magellanic Cloud.
- First Results from the Goddard High-Resolution Spectrograph: Evidence for Photospheric Microturbulence in Early O Stars: Are Surface Gravities Systematically Underestimated? I. Hubeny, S. R. Heap, & B. Altner. 377, L33, 143-D11 (1991)
- IUE Observations of NGC 1068: The Extremely Luminous Starburst Knots. F. C. Bruhweiler, K. Q. Truong, & B. Altner. 379, 596, 172-B1 (1991)
- ALY, J. J. How Much Energy Can Be Stored in a Three-dimensional Force-free Magnetic Field? J. J. Aly. 375, L61, 124-C11 (1991)
- AMARI, SACHIKO. Interstellar Grains within Interstellar Grains. Thomas J. Bernatowicz, Sachiko Amari, Ernst K. Zinner, & Roy S. Lewis. 373, L73, 97-E10 (1991)
- Isotopically Anomalous Ti in Presolar SiC from the Murchison Meteorite. Trevor R. Ireland, Ernst K. Zinner, & Sachiko Amari. 376, L53, 137-D7 (1991)
- s-Process Ba, Nd, and Sm in Presolar SiC from the Murchison Meteorite. Ernst Zinner, Sachiko Amari, & Roy S. Lewis. 382, L47, 205-E11 (1991)
- AMARI, T. A Twisted Flux-Tube Model for Solar Prominences. III. Magnetic Support. C. Ridgway, E. R. Priest, & T. Amari. 367, 321, 16-A10 (1991)

- Prominence Sheets Supported by Constant-Current Force-free Fields. I. Imposition of Normal Magnetic Field Components at the Current Sheet and the Photosphere. *C. Ridgway, T. Amari, & E. R. Priest.* 378, 773, 162-A1 (1991)
- AMEEN, MUDHAFFER M. An Interactive Companion to the S Star HD 35155. *Thomas B. Ake III, Hollis R. Johnson, & Mudhaffer M. Ameen.* 383, 842, 224-F7 (1991)
- AMENDT, PETER. Extended Stellar Hydrodynamics for Galactic Disks. *Peter Amendt & Phil Cuddeford.* 368, 79, 24-B1 (1991)
- Extended Stellar Hydrodynamics for Galactic Disks: Erratum. *Peter Amendt & Phil Cuddeford.* 375, 427, 116-B12 (1991) (Orig. paper in 368, 79, 24-B1 (1991))
- AMSTERDAMSKI, P. Gamma-Ray Bursts from Colliding Strange Stars. *P. Haensel, B. Paczyński, & P. Amsterdamski.* 375, 209, 113-E10 (1991)
- AN, C.-H. Magnetic Confinement, Alfvén Wave Reflection, and the Origins of X-Ray and Mass-Loss "Dividing Lines" for Late-Type Giants and Supergiants. *R. Rosner, C.-H. An, Z. E. Musielak, R. L. Moore, & S. T. Suess.* 372, L91, 85-E5 (1991)
- Alfvén Wave Trapping, Network Microflaring, and Heating in Solar Coronal Holes. *R. L. Moore, Z. E. Musielak, S. T. Suess, & C.-H. An.* 378, 347, 155-C5 (1991)
- ANDERS, EDWARD.  $^{26}\text{Al}$  and  $^{16}\text{O}$  in the Early Solar System: Clues from Meteoritic  $\text{Al}_2\text{O}_3$ . *Edward Anders, Alois Virág, Ernst Zinner, & Roy S. Lewis.* 373, L77, 97-F6 (1991)
- ANDERSON, C. M. On the Wind Geometry of the Wolf-Rayet Star EZ Canis Majoris. *R. E. Schulte-Ladbeck, K. H. Nordsteck, M. Taylor, M. A. Nook, K. S. Bjorkman, A. M. Magalhães, & C. M. Anderson.* 382, 301, 204-A1 (1991)
- See TAYLOR, M., et al. First Ultraviolet Spectropolarimetry of Hot Supergiants.
- See BJORKMAN, K. S., et al. First Ultraviolet Spectropolarimetry of Be Stars from the Wisconsin Ultraviolet Photo-Polarimeter Experiment.
- ANDERSON, J. D. See KRISHER, T. P., et al. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of Voyager 2.
- ANDERSON, JOHN D. Voyager 2 Test of the Radar Time-Delay Effect. *Timothy P. Krisher, John D. Anderson, & Anthony H. Taylor.* 373, 665, 96-C1 (1991)
- ANDERSON, M. Relativistic Electron Populations in Cassiopeia A. *M. Anderson, L. Rudnick, P. Leppik, R. Perley, & R. Braun.* 373, 146, 87-G4 (1991)
- ANDERSON, M. L. Correlations between Far-Infrared, Radio, and Blue Luminosities of Spiral Galaxies. *J. J. Condon, M. L. Anderson, & G. Helou.* 376, 95, 126-B7 (1991)
- ANDERSON, S. B. Timing Observations of the 8 Hour Binary Pulsar 2127+11C in the Globular Cluster M15. *T. A. Prince, S. B. Anderson, S. R. Kulkarni, & A. Wolszczan.* 374, L41, 110-C1 (1991)
- ANDERSON, SCOTT F. Faint Object Camera Observations of a Globular Cluster Nova Field. *Bruce Margon, Scott F. Anderson, Ronald A. Downes, Ralph C. Bohlin, & Peter Jakobsen.* 369, L71, 46-C1 (1991)
- ANDERSON, TODD. Millimeter- and Submillimeter-Wave Spectrum of Highly Excited States of Water. *J. C. Pearson, Todd Anderson, Eric Herbst, Frank C. De Lucia, & Paul Helminger.* 379, L41, 169-D12 (1991)
- ANDERSSON, B-G. Warm Neutral Halos around Molecular Clouds. III. Interpretation of H I and CO  $J = 1-0$  Data. *B-G Andersson, Peter G. Wannier, & Mark Morris.* 366, 464, 8-F1 (1991)
- Warm Neutral Halos around Molecular Clouds. II. H I and CO ( $J = 1-0$ ) Observations. *Peter G. Wannier, B-G Andersson, Mark Morris, & Steven M. Lichten.* 75, 987, 16-B1 (1991)
- Abundances in Red Giant Stars: Nitrogen Isotopes in Carbon-rich Molecular Envelopes. *P. G. Wannier, B-G Andersson, H. Olofsson, N. Ukita, & K. Young.* 380, 593, 185-E8 (1991)
- ANDO, T. See NAGAI, Y., et al. Capture Rate of the  $^7\text{Li}(n, \gamma)^8\text{Li}$  Reaction by Prompt Gamma-Ray Detection.
- ANDRÉ, PHILIPPE. Direct VLBI Detection of the Magnetosphere Surrounding the Young Star S1 in  $\rho$  Ophiuchi. *Philippe André, Robert B. Phillips, Jean-François Lestrade, & Karl-Ludwig Klein.* 376, 630, 134-B12 (1991)
- An Observational Connection between Circumstellar Disk Mass and Molecular Outflows. *Sylvie Cabrit & Philippe André.* 379, L25, 169-C6 (1991)
- A Rich Cluster of Radio Stars in the  $\rho$  Ophiuchi Cloud Cores. *James A. Leous, Eric D. Feigelson, Philippe André, & Thierry Montmerle.* 379, 683, 173-B10 (1991)
- ANDRBANI, P. Diffuse Galactic Emission at Millimetric Wavelengths. *P. Andreani, G. Dall'Olgo, L. Martinis, L. Piccirillo, L. Pizzo, L. Rossi, & C. Venturini.* 375, 148, 112-G5 (1991)
- ANGELINI, L. The Discovery of an X-Ray Burst and a Study of Aperiodic Variability from SMC X-1. *L. Angelini, L. Stella, & N. E. White.* 371, 332, 64-C1 (1991)
- ANGLADA, G. Multifrequency VLA Observations of Radio Continuum from IRAS 16293-2422. *R. Estalella, G. Anglada, L. F. Rodríguez, & G. Garay.* 371, 626, 69-C12 (1991)
- ANGLADA, GUILLERM. A Double Radio Source at the Center of the Outflow in L723. *Guillermo Anglada, Robert Estalella, Luis F. Rodríguez, José M. Torrelles, Rosario López, & Jorge Cantó.* 376, 615, 134-A7 (1991)
- ANNINOS, PETER. Anisotropies of the Cosmic Background Radiation in a "Hot" Dark Matter Universe. *Peter Anninos, Richard A. Maizner, Robin Tuluie, & Joan Centrella.* 382, 71, 201-A1 (1991)
- ANTIOCHOS, S. K. A Model for the Formation of Solar Prominences. *S. K. Antiochos & J. A. Klimchuk.* 378, 372, 155-E6 (1991)
- Nonequilibrium Ionization Effects in Asymmetrically Heated Loops. *D. Spadaro, S. K. Antiochos, & J. T. Mariska.* 382, 338, 204-D1 (1991)
- Dynamics of Solar Coronal Magnetic Fields. *R. B. Dahlburg, S. K. Antiochos, & T. A. Zang.* 383, 420, 217-E1 (1991)
- ANTIOCHOS, SPIRO K. Coronal Current-Sheet Formation: The Effect of Asymmetric and Symmetric Shears. *Judith T. Karpen, Spiro K. Antiochos, & C. Richard DeVore.* 382, 327, 204-C4 (1991)
- ANTON, K. See QUIRRENBACH, A., et al. Correlated Radio and Optical Variability in the BL Lacertae Object 0716+714.
- ANTONUCCI, R. R. J. HST Imaging of the Inner 3 Arcseconds of NGC 1068 in the Light of [O III]  $\lambda 5007$ . *I. N. Evans, H. C. Ford, A. L. Kinney, R. R. J. Antonucci, L. Armus, & S. Caganoff.* 369, L27, 45-C9 (1991)
- The Featureless Continua and Hydrogen Lines of Seyfert 2 Galaxies. *A. L. Kinney, R. R. J. Antonucci, M. J. Ward, A. S. Wilson, & M. Whittle.* 377, 100, 139-C5 (1991)
- See CAGANOFF, S., et al. Faint Object Spectrograph Spectroscopy of Resolved Structure in the Nucleus of NGC 1068.
- AOKI, T. See MURAKI, Y., et al. Observations of Ultra-High-Energy Photons from Cygnus X-3.
- APPARAO, K. M. V. Spin-up of the White Dwarf in the Intermediate Polar 3A 0729+103. *Jyoti Singh, P. C. Agarwal, K. M. V. Apparao, P. Vivekananda Rao, & M. B. K. Sarna.* 380, 208, 178-E11 (1991)
- APPARAO, KRISHNA M. V. EXOSAT Observations of the X-Ray Source 2S 0114+65. *Krishna M. V. Apparao, P. Bishi, & K. P. Singh.* 371, 772, 71-B6 (1991)
- Flares in the X-Ray Source EXO 2030+375. *Krishna M. V. Apparao.* 375, 701, 121-D7 (1991)
- Optical Emission Enhancements in Be Stars. *Krishna M. V. Apparao.* 376, 256, 128-B3 (1991)
- APPLEGATE, JAMES H. On the Explosion in a Common Envelope Scenario for Type Ia Supernovae. *James H. Applegate.* 370, 324, 51-C9 (1991)
- APPLETON, P. N. Far-Infrared Counterpart to the Optical and H I Plume in the Leo Triplet of Galaxies: NGC 3623, NGC 3627, and NGC 3628. *D. H. Hughes, P. N. Appleton, & J. M. Schombert.* 370, 176, 49-C11 (1991)
- ARCORAGI, JEAN-PIERRE. Fragmentation of Elongated Cylindrical Clouds. III. Formation of Binary and Multiple Systems. *Ian Bonnell, Hugo Martel, Pierre Bastien, Jean-Pierre Arcoragi, & Willy Benz.* 377, 553, 146-E5 (1991)
- Fragmentation of Elongated Cylindrical Clouds. I. Isothermal Clouds. *Pierre Bastien, Jean-Pierre Arcoragi, Willy Benz, Ian Bonnell, & Hugo Martel.* 378, 255, 154-B5 (1991)
- Fragmentation of Elongated Cylindrical Clouds. II. Polytropic Clouds. *Jean-Pierre Arcoragi, Ian Bonnell, Hugo Martel, Willy Benz, & Pierre Bastien.* 380, 476, 184-B7 (1991)

- ARENTE, RICHARD G. An Infrared Analysis of Puppis A. *Richard G. Arendt, Eli Dwek, & Robert Petre.* 368, 474, 31-A7 (1991)
- ARENS, J. F. Discovery of Interstellar Methane: Observations of Gaseous and Solid CH<sub>4</sub> Absorption toward Young Stars in Molecular Clouds. *J. H. Lacy, J. S. Carr, Neal J. Evans II, F. Baas, J. M. Achtermann, & J. F. Arens.* 376, 556, 133-C9 (1991)
- ARENS, JOHN. High Angular Resolution Broad-Band Imaging in the Mid-Infrared: The Infrared-bright Galaxy NGC 34. *Eric Keto, Garrett Jernigan, Roger Ball, John Arens, & Margaret Meixner.* 374, L29, 110-B1 (1991)
- ARMSTRONG, J. W. Coincidence Probabilities for Spacecraft Gravitational Wave Experiments: Massive Coalescing Binaries. *Massimo Tinto & J. W. Armstrong.* 372, 545, 82-E1 (1991)
- ARMUS, L. *HST Imaging of the Inner 3 Arcseconds of NGC 1068 in the Light of [O III] λ5007.* *I. N. Evans, H. C. Ford, A. L. Kinney, R. R. J. Antonucci, L. Armus, & S. Caganoff.* 369, L27, 45-C9 (1991)
- See CAGANOFF, S., et al. Faint Object Spectrograph Spectroscopy of Resolved Structure in the Nucleus of NGC 1068.
- Faint Object Spectrograph Observations of the Low-Luminosity Seyfert Galaxy NGC 1566. *G. A. Kriss, G. F. Harng, L. Armus, William P. Blair, S. Caganoff, & L. Dressel.* 377, L13, 143-C1 (1991)
- ARNAUD, K. A. A Measurement of the Value of the Hubble Constant from the X-Ray Properties and the Sunyaev-Zel'dovich Effect of Abell 665. *M. Birkinshaw, J. P. Hughes, & K. A. Arnaud.* 379, 466, 170-E1 (1991)
- ARNAUD, KEITH A. A Ubiquitous Absorption Feature in the X-Ray Spectra of BL Lacertae Objects. *Greg M. Madejski, Richard E. Mushotzky, Kimberly A. Weaver, Keith A. Arnaud, & C. Megan Urry.* 370, 198, 49-F1 (1991)
- A Measurement of the Mass Fluctuation Spectrum from the Cluster X-Ray Temperature Function. *J. Patrick Henry & Keith A. Arnaud.* 372, 410, 80-G11 (1991)
- ARNETT, DAVID. Instabilities and Clumping in SN 1987A. I. Early Evolution in Two Dimensions. *Bruce Fryxell, Ewald Müller, & David Arnett.* 367, 619, 21-A5 (1991)
- Massive Star Evolution and SN 1987A. *David Arnett.* 383, 295, 215-G8 (1991)
- ARONS, JONATHAN. Accretion Powered Pulsars: Continuum Spectra and Light Curves of Settling Accretion Mounds. *David J. Burnard, Jonathan Arons, & Richard I. Klein.* 367, 575, 20-D10 (1991)
- ARP, HALTON. The Properties of NGC 2777: Are Companion Galaxies Young? *Halton Arp & Jack W. Sulentic.* 375, 569, 119-G1 (1991)
- ARRIBAS, S. An Optical Fiber System to Perform Bidimensional Spectroscopy. *S. Arribas, E. Mediavilla, & J. L. Rasilla.* 369, 260, 39-B9 (1991)
- ARTYMOWICZ, P. The Effect of an External Disk on the Orbital Elements of a Central Binary. *P. Artymowicz, C. J. Clarke, S. H. Lubow, & J. E. Pringle.* 370, L35, 53-E7 (1991)
- ASCHWANDEN, MARKUS J. Solar and Stellar Radio Spikes: Limits on the Saturation of the Electron-Cyclotron Maser. *Donat G. Wentzel & Markus J. Aschwanden.* 372, 688, 84-C1 (1991)
- ASHMAN, KEITH M. The Dark Matter Content of Spiral Galaxies. *Paolo Salucci, Keith M. Ashman, & Massimo Persic.* 379, 89, 164-B1 (1991)
- ASHOKA, B. N. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-815A with the Whole Earth Telescope.
- ASMAR, S. W. See KRISHER, T. P., et al. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of *Voyager 2*.
- ASPIN, C. Molecular Hydrogen Polarization Images of OMC-1. *Michael G. Burton, N. R. Minchin, J. H. Hough, C. Aspin, D. J. Axon, & J. A. Bailey.* 375, 611, 120-C9 (1991)
- ASPIN, COLIN. NGC 1333 IRAS 4: A Very Young, Low-Luminosity Binary System. *Göran Sandell, Colin Aspin, William D. Duncan, Adrian P. G. Russell, & E. Ian Robson.* 376, L17, 130-C1 (1991)
- ATHAY, R. GRANT. Chromospheric and Transition Region Diagnostics Using Emission-Line Intensities. *R. Grant Athay & K. P. Dere.* 379, 776, 174-D1 (1991)
- Velocity Gradients in the Chromosphere-Corona Transition Region. *R. Grant Athay & K. P. Dere.* 381, 323, 193-A6 (1991)
- ATOYAN, A. M. A Model of Pulsed Gamma Radiation from the X-Ray Binary Hercules X-1/HZ Herculis. *F. A. Aharonian & A. M. Atoyan.* 381, 220, 191-F8 (1991)
- ATRIO-BARANDELA, F. Fluctuations of the Microwave Background Radiation on Large and Intermediate Angular Scales. *F. Atrio-Baraneda, A. G. Doroshkevich, & A. A. Klypin.* 378, 1, 151-A11 (1991)
- AUER, LAWRENCE H. Ultraviolet Variability of the Massive W-R Binary System HDE 311884 = WR 47. *Gloria Koenigsberger, Anthony F. J. Moffat, & Lawrence H. Auer.* 376, 272, 128-C9 (1991)
- AUFDERHEIDE, M. B. Shock Waves and Nucleosynthesis in Type II Supernovae. *M. B. Aufderheide, E. Baron, & F.-K. Thielemann.* 370, 630, 56-C8 (1991)
- AUMANN, HARTMUT H. Search for Vega-like Nearby Stars with 12 Micron Excess. *Hartmut H. Aumann & Ronald G. Probst.* 368, 264, 26-D1 (1991)
- AVRETT, E. H. Energy Balance in the Solar Transition Region. II. Effects of Pressure and Energy Input on Hydrostatic Models. *J. M. Fontenla, E. H. Avrett, & R. Loeser.* 377, 712, 148-E1 (1991)
- Formation of the Infrared Emission Lines of Mg I in the Solar Atmosphere. *E. S. Chang, E. H. Avrett, P. J. Mauas, R. W. Noyes, & R. Loeser.* 379, L79, 175-E1 (1991)
- AWAKI, H. See KII, T., et al. X-Ray Continuum and Evidence for an Iron Emission Line from the Quasar E1821+643.
- AXELROD, TIMOTHY S. See GRIEST, KIM, et al. Gravitational Microlensing as a Method of Detecting Disk Dark Matter and Faint Disk Stars.
- AXON, D. J. Molecular Hydrogen Polarization Images of OMC-1. *Michael G. Burton, N. R. Minchin, J. H. Hough, C. Aspin, D. J. Axon, & J. A. Bailey.* 375, 611, 120-C9 (1991)
- AYMON, J. See SMOOTH, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- AYRES, THOMAS R. The Many Faces of F Stars: A Rotational Modulation Study of Capella, Procyon, and Caph with the International Ultraviolet Explorer. *Thomas R. Ayres.* 375, 704, 121-D11 (1991)
- Digging in the Coronal Graveyard: A ROSAT Observation of the Red Giant Arcturus. *Thomas R. Ayres, Thomas A. Fleming, & Juergen H. M. M. Schmitt.* 376, L45, 137-C7 (1991)
- BAAS, F. Discovery of Interstellar Methane: Observations of Gaseous and Solid CH<sub>4</sub> Absorption toward Young Stars in Molecular Clouds. *J. H. Lacy, J. S. Carr, Neal J. Evans II, F. Baas, J. M. Achtermann, & J. F. Arens.* 376, 556, 133-C9 (1991)
- Interstellar Solid CO: Polar and Nonpolar Interstellar Ices. *A. G. M. Tielens, A. T. Tokunaga, T. R. Geballe, & F. Baas.* 381, 181, 191-C5 (1991)
- BARABAL, G. See BOUCHET, L., et al. SIGMA Discovery of Variable  $e^+e^-$  Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7-2942.
- See SUNYAEV, R., et al. Three Spectral States of 1E 1740.7-2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature.
- BABEL, J. A Crucial Test of the Diffusion Model: 53 Camelopardalis. *J. Babel & G. Michaud.* 366, 560, 10-A5 (1991)
- BABLER, B. L. See TAYLOR, M., et al. First Ultraviolet Spectropolarimetry of Hot Supergiants.
- See BJORKMAN, K. S., et al. First Ultraviolet Spectropolarimetry of Be Stars from the Wisconsin Ultraviolet Photo-Polarimeter Experiment.
- BACKER, D. C. A Spectral Study of Four Millisecond Pulsars. *R. S. Foster, L. Fairhead, & D. C. Backer.* 378, 687, 161-A1 (1991)
- BACKMAN, DANA E. A Survey for Infrared Excesses among High Galactic Latitude SAO Stars. *Robert E. Stencel & Dana E. Backman.* 75, 905, 14-A1 (1991)
- BACKUS, C. See SMOOTH, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- BADINO, G. See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- BADNELL, N. R. Dielectronic Recombination Rate Coefficients for S<sup>q+</sup> ( $q = 1-5$ ) Ions. *N. R. Badnell.* 379, 356, 167-D9 (1991)

- BAGNUOLO, WILLIAM G., JR. Tomographic Separation of Composite Spectra: The Components of the O-Star Spectroscopic Binary AO Cassiopeiae. *William G. Bagnuolo, Jr., & Douglas R. Gies.* 376, 266, 128-C1 (1991)
- BAGRI, DURGADAS S. A Search for Redshifted Neutral Hydrogen from Protoclusters of Galaxies. *Juan M. Uson, Durgadas S. Bagri, & Timothy J. Cornwell.* 377, L65, 150-B1 (1991)
- BAHCALL, J. N. The Ultraviolet Absorption Spectrum of 3C 273. *J. N. Bahcall, B. T. Jannuzi, D. P. Schneider, G. F. Hartig, R. Bohlin, & V. Junkkarinen.* 377, L5, 143-B6 (1991)
- BAHCALL, JOHN N. Solar-Cycle Modulation of Event Rates in the Chlorine Solar Neutrino Experiment. *John N. Bahcall & William H. Press.* 370, 730, 57-E1 (1991)
- BAHCALL, NETA A. Superclusters and Pencil-Beam Surveys: The Origin of Large-Scale Periodicity. *Neta A. Bahcall.* 376, 43, 125-E6 (1991)
- The Origin of Quasar Correlations. *Neta A. Bahcall & Arati Chokshi.* 380, L9, 181-B11 (1991)
- BAILEY, J. Optical and Near-Infrared Polarimetry of the Infrared Luminous Galaxy IRAS 23060+0505. *J. H. Hough, C. Brindle, Beverley J. Wills, D. Wills, & J. Bailey.* 372, 478, 81-F9 (1991)
- BAILEY, J. A. Mapping of Infrared Helium and Hydrogen Line Profiles in the Central Few Arcseconds of the Galaxy. *T. R. Geballe, K. Krisciunas, J. A. Bailey, & R. Wade.* 370, L73, 59-C8 (1991)
- Molecular Hydrogen Polarization Images of OMC-1. *Michael G. Burton, N. R. Minchin, J. H. Hough, C. Aspin, D. J. Axon, & J. A. Bailey.* 375, 611, 120-C9 (1991)
- See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- BAKER, A. C. See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- BALACHANDRAN, S. The Pulse-timing and Emission-Line Orbits of the White Dwarf in the Cataclysmic Variable AE Aquarii. *Edward L. Robinson, Allen W. Shafter, & S. Balachandran.* 374, 298, 101-G1 (1991)
- BALASUBRAMANIAM, K. S. Vector Magnetic Fields in Sunspots. I. Stokes Profile Analysis Using the Marshall Space Flight Center Magnetograph. *K. S. Balasubramaniam & E. A. West.* 382, 699, 210-C11 (1991)
- BALBUS, S. A. See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- BALBUS, STEVEN A. On Magnetothermal Instability in Cluster Cooling Flows. *Steven A. Balbus.* 372, 25, 74-C13 (1991)
- A Powerful Local Shear Instability in Weakly Magnetized Disks. I. Linear Analysis. *Steven A. Balbus & John F. Hawley.* 376, 214, 127-E11 (1991)
- A Powerful Local Shear Instability in Weakly Magnetized Disks. II. Nonlinear Evolution. *John F. Hawley & Steven A. Balbus.* 376, 223, 127-F8 (1991)
- BALCELLS, MARC. Dynamical Simulations of the Interacting Galaxies in the NGC 520/UGC 957 System. *S. A. Stanford & Marc Balcells.* 370, 118, 48-E5 (1991)
- BALDWIN, JACK A. Physical Conditions in the Orion Nebula and an Assessment of Its Helium Abundance. *Jack A. Baldwin, Gary J. Ferland, P. G. Martin, Michael R. Corbin, Stephen A. Cota, Bradley M. Peterson, & Arne Slettebak.* 374, 580, 106-D1 (1991)
- BALICK, BRUCE. Evidence for a Thermally Unstable Shock Wave in the Vela Supernova Remnant. *John C. Raymond, George Wallerstein, & Bruce Balick.* 383, 226, 214-G5 (1991)
- BALIUNAS, SALLIE L. See DUNCAN, DOUGLAS K., et al. Ca II H and K Measurements Made at Mount Wilson Observatory, 1966-1983.
- BALL, ROGER. High Angular Resolution Broad-Band Imaging in the Mid-Infrared: The Infrared-bright Galaxy NGC 34. *Eric Keto, Garrett Jernigan, Roger Ball, John Arens, & Margaret Meixner.* 374, L29, 110-B1 (1991)
- BALLETT, J. See BARRET, D., et al. Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2.
- BALLY, JOHN. An Unbiased Survey for Dense Cores in the Lynds 1630 Molecular Cloud. *Elizabeth A. Lada, John Bally, & Antony A. Stark.* 368, 432, 30-D9 (1991)
- Molecular Outflows in the L1641 Region of Orion. *James A. Morgan & John Bally.* 372, 505, 82-B1 (1991)
- Molecular Outflows Associated with Young Stellar Objects in the L1641 Region of Orion. *James A. Morgan, F. Peter Schloerb, Ronald L. Snell, & John Bally.* 376, 618, 134-A12 (1991)
- Infrared Dust and Millimeter-Wave Carbon Monoxide Emission in the Orion Region. *John Bally, William D. Langer, & Weihong Liu.* 383, 645, 222-C6 (1991)
- Two New Molecular Outflows in L1551? *Marc W. Pound & John Bally.* 383, 705, 223-A7 (1991)
- BALONEK, T. J. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- BALSIGER, H. Densities and Abundances of Hot Cometary Ions in the Coma of P/Halley. *M. Neugebauer, R. Goldstein, B. E. Goldstein, S. A. Fuselier, H. Balsiger, & W.-H. Ip.* 372, 291, 77-E6 (1991)
- Observations of Solar Wind Ion Charge Exchange in the Comet Halley Coma. *S. A. Fuselier, E. G. Shelley, B. E. Goldstein, R. Goldstein, M. Neugebauer, W.-H. Ip, H. Balsiger, & H. Reme.* 379, 734, 173-G8 (1991)
- BANDAY, A. J. Cosmic Rays and Cosmological Microwave Background Fluctuations. *A. J. Banday, M. Giler, B. Szabelska, J. Szabelski, & A. W. Wolfendale.* 375, 432, 118-B5 (1991)
- BANDIERA, RINO. Changes in the Optical Remnant of Kepler's Supernova during the Period 1942-1989. *Rino Bandiera & Sidney van den Bergh.* 374, 186, 100-C11 (1991)
- BANIA, T. M. Radial Velocity Measurements in the Pleiades. *T. Liu, Kenneth A. Jones, & T. M. Bania.* 377, 141, 139-F7 (1991)
- BANIA, THOMAS M. Detection of Local Interstellar CO Absorption toward BL Lacertae. *Alan P. Marscher, Thomas M. Bania, & Zhong Wang.* 371, L77, 73-D7 (1991)
- BAO, Z. Y. The s-Process Branchings at  $^{185}\text{W}$  and  $^{186}\text{Re}$ . *F. Käppeler, S. Jaag, Z. Y. Bao, & G. Reffo.* 366, 605, 10-E5 (1991)
- BARANOV, V. B. The Influence of the Interface between the Heliosphere and the Local Interstellar Medium on the Penetration of the H Atoms to the Solar System. *V. B. Baranov, M. G. Lebedev, & Yu. G. Malama.* 375, 347, 115-C1 (1991)
- BARBIER, L. M. On the Differences in Element Abundances of Energetic Ions from Corotating Events and from Large Solar Events. *D. V. Reames, I. G. Richardson, & L. M. Barbier.* 382, L43, 205-E7 (1991)
- BARBIERI, C. See MACCHETTO, F., et al. First Results from the Faint Object Camera: Observations of PKS 0521-36.
- See CRANE, P., et al. First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305.
- See JAKOBSEN, P., et al. First Results from the Faint Object Camera: SN 1987A.
- See PARESC, F., et al. First Results from the Faint Object Camera: Imaging the Core of R Aquarii.
- See MACCHETTO, F., et al. HST Observations of 3C 66B: A Double-stranded Optical Jet.
- See ALBRECHT, R., et al. First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System.
- See WEIGELT, G., et al. First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.
- BARBUY, B. Metal-rich Giant Branches of Bulge Clusters: Application to Color-Magnitude Diagrams of M31 and M32. *E. Bica, B. Barbuy, & S. Ortolani.* 382, L15, 205-B12 (1991)
- BARKER, E. S. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- BARKER, EDWIN S. New Ultraviolet Spectroscopic Features Found in Comet Borensen-Metcalf (1989o). *C. R. O'Dell, Christopher O. Miller, Anita L. Cochran, William D. Cochran, Chet B. Opal, & Edwin S. Barker.* 368, 616, 32-G1 (1991)
- BARKER, JOHN R. Polycyclic Aromatic Hydrocarbon Optical Properties and Contribution to the Acceleration of Stellar Outflows. *Isabelle Cherchneff, John R. Barker, & Alexander G. G. M. Tielens.* 377, 541, 146-D6 (1991)

- BARKER, TIMOTHY. The Ionization Structure of Planetary Nebulae. X. NGC 2392. *Timothy Barker*. 371, 217, 62-G5 (1991)
- BARLOW, M. J. Terminal Velocities for a Large Sample of O Stars, B Supergiants, and Wolf-Rayet Stars: Erratum. *Raman K. Prinja, M. J. Barlow, & Ian D. Howarth*. 383, 466, 218-B1 (1991) (Orig. paper in 379, 734, 173-G8 (1991))
- BARNES, JOSHUA E. Fueling Starburst Galaxies with Gas-rich Mergers. *Joshua E. Barnes & Lars E. Hernquist*. 370, L65, 59-B7 (1991)
- BARNES, THOMAS G., III. Absolute Magnitudes and Kinematic Properties of Cepheids. *Teresa D. Wilson, Thomas G. Barnes III, Suzanne L. Hawley, & William H. Jefferys*. 378, 708, 161-B1 (1991)
- BARON, E. Shock Waves and Nucleosynthesis in Type II Supernovae. *M. B. Aufderheide, E. Baron, & F.-K. Thielemann*. 370, 630, 56-C8 (1991)
- Strangeness Condensation, Nucleon Superfluidity, and Cooling of Neutron Stars: Erratum. *Dany Page & E. Baron*. 382, L111, 211-F12 (1991) (Orig. paper in 354, L17, 80-C1 (1990))
- BAROUCH, E. See MASSARO, E., et al. Detection of Feature at 0.44 MeV in the Crab Pulsar Spectrum with FIGARO II: A Redshifted Positron Annihilation Line?
- BARRET, D. Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2. *D. Barret, S. Mereghetti, J. P. Roques, P. Mandrou, L. Salotti, F. Lebrun, Ph. Laurent, J. Ballet, E. Churazov, M. Gifanov, R. Sunyaev, N. Khavenson, I. Chukov, B. Novikov, A. Kuznetsov, & A. Dyachkov*. 379, L21, 169-C1 (1991)
- BARRETO, W. The Evolution of Discontinuities in Radiating Spheres in the Diffusion Approximation. *W. Barreto, L. Herrera, & L. Núñez*. 375, 663, 121-A1 (1991)
- BARSELLA, B. Evolution of Dust Grains through a Hot Gaseous Halo. *A. Ferrara, F. Ferrini, J. Franco, & B. Barsella*. 381, 137, 190-F9 (1991)
- BARSELLA, BRUNO. Photolevitation of Diffuse Clouds. *José Franco, Federico Ferrini, Andrea Ferrara, & Bruno Barsella*. 366, 443, 8-D1 (1991)
- BARSONY, M. The LkHα 101 Infrared Cluster. *M. Barsony, J. M. Schombert, & K. Kis-Halas*. 379, 221, 165-G1 (1991)
- BARSTOW, M. A. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- BARTHEL, PETER D. See WINDHORST, ROGIER A., et al. The Discovery of a Young Radio Galaxy at  $z = 2.390$ : Probing Initial Star Formation at  $z \lesssim 3.0$ .
- BARTHELMY, S. D. GRIS Observations of  $^{26}\text{Al}$  Gamma-Ray Line Emission from Two Points in the Galactic Plane. *B. J. Teegarden, S. D. Barthelmy, N. Gehrels, J. Tueller, M. Leventhal, & C. J. MacCallum*. 375, L9, 117-B4 (1991)
- GRIS Observations of Positron Annihilation Radiation from the Galactic Center. *N. Gehrels, S. D. Barthelmy, B. J. Teegarden, J. Tueller, M. Leventhal, & C. J. MacCallum*. 375, L13, 117-B10 (1991)
- BARTLETT, JAMES G. Did the Universe Recombine? *James G. Bartlett & Albert Stebbins*. 371, 8, 60-B9 (1991)
- BARTOE, J.-D. F. An Ultraviolet Spectral Atlas of a Sunspot and an Active Region 1190-1730 Å. *P. Brekke, O. Kjeldseth-Moe, J.-D. F. Bartoe, & G. E. Brueckner*. 75, 1337, 23-C1 (1991)
- BARVAINIS, RICHARD. Polarimetric Mapping of Orion Using MILIPOL: Magnetic Activity in BN/KL. *Robert W. Leach, Dan P. Clemens, Brian D. Kane, & Richard Barvainis*. 370, 257, 50-D1 (1991)
- BASART, JOHN P. Depolarization Asymmetry in the Quasar 3C 47. *Ilias Fernini, J. Patrick Leahy, Jack O. Burns, & John P. Basart*. 381, 63, 189-G1 (1991)
- BASH, F. N. Molecular Gas Excitation in NGC 253. *W. F. Wall, D. T. Jaffe, E. P. Israel, & F. N. Bash*. 380, 384, 183-A11 (1991)
- BASH, FRANK N. A Statistical Study of the Correlation of Galactic Supernova Remnants and Spiral Arms. *Zongwei Li, J. Craig Wheeler, Frank N. Bash, & W. H. Jefferys*. 378, 93, 152-B9 (1991)
- BASSANI, L. See UBERTINI, P., et al. "Superlow-State" Hard X-Ray Observation of Cygnus X-1.
- See PEROTTI, F., et al. Hard X-Ray Variability of NGC 4151.
- BASTIAN, T. S. Solar Radio Microbursts at 1.4 GHz. *T. S. Bastian*. 370, L49, 53-F11 (1991)
- BASTIEN, PIERRE. The Collapse of Cylindrical Isothermal and Polytropic Clouds with Rotation. *Ian Bonnell & Pierre Bastien*. 374, 610, 106-F5 (1991)
- Fragmentation of Elongated Cylindrical Clouds. III. Formation of Binary and Multiple Systems. *Ian Bonnell, Hugo Martel, Pierre Bastien, Jean-Pierre Arcoragi, & Willy Benz*. 377, 553, 146-E5 (1991)
- Fragmentation of Elongated Cylindrical Clouds. I. Isothermal Clouds. *Pierre Bastien, Jean-Pierre Arcoragi, Willy Benz, Ian Bonnell, & Hugo Martel*. 378, 255, 154-B5 (1991)
- Fragmentation of Elongated Cylindrical Clouds. II. Polytropic Clouds. *Jean-Pierre Arcoragi, Ian Bonnell, Hugo Martel, Willy Benz, & Pierre Bastien*. 380, 476, 184-B7 (1991)
- BATES, B. Spatial Structure of the Interstellar Gas toward the Globular Cluster M22. *B. Bates & M. G. Comey*. 371, L37, 66-E7 (1991)
- BATES, DAVID R. Association of  $\text{CH}_3^+$  and  $\text{H}_2$ : Conflicting Results. *David R. Bates*. 375, 833, 123-A5 (1991)
- BATUSKI, DAVID J. Comparison of Likely Candidate Models for Abell Cluster Structures against the Observed Distribution. *David J. Batuski, Adrian L. Melott, Robert J. Scherrer, & Edmund Bertschinger*. 367, 393, 18-C11 (1991)
- BAUM, S. A. What Are the Gigahertz Peaked-Spectrum Radio Sources? *C. P. O'Dea, S. A. Baum, & C. Stanghellini*. 380, 66, 176-G5 (1991)
- BAUM, STEPHEN A. A New Look at the "Jet" in the CTB 37A/B Supernova Remnant Complex. *Namir E. Kassim, Stefanie A. Baum, & Kurt W. Weiler*. 374, 212, 100-F9 (1991)
- BAUM, WILLIAM A. See LYNN, ROGER, et al. NGC 1068: Resolution of Nuclear Structure in the Optical Continuum.
- See HOLTZMAN, JON A., et al. Stellar Photometry with the *Hubble Space Telescope* Wide-Field/Planetary Camera: A Progress Report.
- See LAUER, TOD R., et al. The Core of the Nearby S0 Galaxy NGC 7457 Imaged with the *HST* Planetary Camera.
- See LAUER, TOD R., et al. The Postcollapse Core of M15 Imaged with the *HST* Planetary Camera.
- See WESTPHAL, JAMES A., et al. *Hubble Space Telescope* Wide-Field/Planetary Camera Images of Saturn.
- BAUMERT, B. M. The Microwave Brightness Temperature Spectrum of the Quiet Sun. *H. Zirin, B. M. Baumert, & G. J. Hurford*. 370, 779, 58-B12 (1991)
- BAUMGART, DAVID J. Fourier Spectra of Three-dimensional Data. *David J. Baumgart & J. N. Fry*. 375, 25, 111-C11 (1991)
- BAUSCHLICHER, CHARLES W., JR. Theoretical Study of the Spectroscopy of  $\text{FeH}^+$ . *Stephen R. Langhoff & Charles W. Bauschlicher, Jr.* 375, 843, 123-B1 (1991)
- BAUTZ, MARSHALL W. Galaxy Evolution in Distant, X-Ray-Selected Clusters of Galaxies. I. Cl 1358+6245. *Daniel G. Fabricant, Jeffrey E. McClintock, & Marshall W. Bautz*. 381, 33, 189-D8 (1991)
- BAXTER, D. See MACCHETTO, F., et al. First Results from the Faint Object Camera: Observations of PKS 0521-36.
- See CRANE, P., et al. First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305.
- See JAKOBSEN, P., et al. First Results from the Faint Object Camera: SN 1987A.
- See PARESCHE, F., et al. First Results from the Faint Object Camera: Imaging the Core of R Aquarii.
- See MACCHETTO, F., et al. *HST* Observations of 3C 66B: A Double-stranded Optical Jet.
- See ALBRECHT, R., et al. First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System.
- See WEIGELT, G., et al. First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.
- BAZAN, GRANT. Abundances of Te and Related Elements in Stars of Type M, MS, and S. *Andrew D. Vanture, George Wallerstein, Jeffrey A. Brown, & Grant Bazan*. 381, 278, 192-D7 (1991)
- BAZZANO, A. See UBERTINI, P., et al. "Superlow-State" Hard X-Ray Observation of Cygnus X-1.
- Hard X-Rays from Coma Cluster Region: Erratum. *A. Bazzano, R. Fusco-Femiano, P. Ubertini, F. Perotti, E. Quadrini, A. J. Court*,

- A. J. Dean, N. A. Dipper, R. Lewis, & J. B. Stephen.* 366, L95, 11-F1 (1991) (Orig. paper in 362, L51, 181-C1 (1990))
- See PEROTTI, F., et al. Hard X-Ray Variability of NGC 4151.
- Low-Flux Hard X-Ray Observation of Cygnus X-1. *P. Ubertini, A. Bazzano, C. La Padula, R. K. Manchanda, V. F. Polcaro, R. Stauber, E. Kendziorra, & F. Perotti.* 383, 263, 215-D9 (1991)
- BEACOM, JOHN FRANCIS. Gravitational Clustering in the Expanding Universe: Controlled High-Resolution Studies in Two Dimensions. *John Francis Beacom, Kurt G. Dominik, Adrian L. Melott, Sam P. Perkins, & Sergei F. Shandarin.* 372, 351, 80-B7 (1991)
- BEAHM, LORRAINE P. The Charge State of the Anomalous Component: Results from the Trapped Ions in Space Experiment. *James H. Adams, Jr., Lorraine P. Beahm, & Allan J. Tyka.* 377, 292, 141-E9 (1991)
- BEARD, S. M. See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- BEARD, STEVEN. A COSMOS Study of the Structure and Content of NGC 6822. *Paul Hodge, Toby Smith, Paul Eskridge, Harvey MacGillivray, & Steven Beard.* 379, 621, 172-D1 (1991)
- BEARD, STEVEN M. A Cosmos Study of IC 1613. *Paul W. Hodge, Toby R. Smith, Paul B. Eskridge, Harvey T. MacGillivray, & Steven M. Beard.* 369, 372, 42-D5 (1991)
- BEAVER, E. See HUTCHINGS, J. B., et al. First Results from the Goddard High-Resolution Spectrograph: Ultraviolet Spectra of a Starburst Knot in NGC 1068.
- BEAVER, E. A. Far-Ultraviolet Spectroscopy of the Quasar UM 675 with the Faint Object Spectrograph on the *Hubble Space Telescope*. *E. A. Beaver, E. M. Burbidge, Ross D. Cohen, Vesa T. Junkkarinen, Ronald W. Lyons, E. I. Rosenblatt, George F. Hartig, Bruce Margon, & A. F. Davidsen.* 377, L1, 143-B1 (1991)
- BECHTOLD, J. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- BECHTOLD, JILL. Emission from the  $z = 2$  Damped Ly $\alpha$  Absorber toward Q1215+333. *Richard Elston, Jill Bechtold, James Lowenthal, & Marcia Rieke.* 373, L39, 97-B1 (1991)
- A  $\sim 10$  Mpc Void in the Ly $\alpha$  Forest at  $z = 3.17$ . *Adam Dobrzynski & Jill Bechtold.* 377, L69, 150-B10 (1991)
- Confirmation of Dust in Damped Lyman-Alpha Systems. *Yichuan C. Pei, S. Michael Fall, & Jill Bechtold.* 378, 6, 151-B4 (1991)
- BECK, S. See MAOZ, D., et al. High-Rate Active Galaxy Monitoring at the Wise Observatory. III. The Broad-Line Region of NGC 4151.
- BECK, SARA C. Infrared Recombination Lines of Hydrogen from Young Objects in the Southern Galactic Plane. *Sara C. Beck, Jacqueline Fischer, & Howard A. Smith.* 383, 336, 216-D1 (1991)
- BECKER, ROBERT H. The Infrared Properties of Compact Galactic Radio Sources: The Young and the Restless. *Richard L. White, Robert H. Becker, & David J. Helfand.* 371, 148, 62-A1 (1991)
- New Clues to the Cassiopeia A Supernova Progenitor. *Robert A. Fesen & Robert H. Becker.* 371, 621, 69-C4 (1991)
- BECKER, S. R. Echelle Spectroscopy of CD -41° 13967: The Young Central Star of a New Planetary Nebula. *James K. McCarthy, R. Michael Rich, S. R. Becker, K. Butler, D. Husfeld, & H. G. Groth.* 371, 380, 64-G1 (1991)
- BECKLIN, E. E. The Infrared and Optical Pulsations of G29-38. *Joseph Patterson, B. Zuckerman, E. E. Becklin, D. J. Tholen, & T. Hawarden.* 374, 330, 102-C1 (1991)
- Infrared Emission Regions in the Interacting Galaxy System Arp 299. *C. G. Wynn-Williams, S. A. Eales, E. E. Becklin, K.-W. Hodapp, R. D. Joseph, I. S. McLean, D. A. Simons, & G. S. Wright.* 377, 426, 145-A13 (1991)
- Submillimeter Solar Limb Profiles Determined from Observations of the Total Solar Eclipse of 1988 March 18. *T. L. Roellig, E. E. Becklin, J. T. Jefferies, G. A. Kopp, C. A. Lindsey, F. Q. Orrall, & M. W. Werner.* 381, 288, 192-E5 (1991)
- BECKWITH, S. V. W. The Molecular Structure around HL Tauri. *A. I. Sargent & S. V. W. Beckwith.* 382, L31, 205-D6 (1991)
- BECKWITH, STEVEN. An Optical/Infrared Outburst in the Exciting Source of HH 7-11. *Jochen Eislöffel, Eike Günther, Frederic V. Hessman, Reinhard Mundt, Ralf Poetzel, John S. Carr, Steven Beckwith, & Tom P. Ray.* 383, L19, 219-C7 (1991)
- BECKWITH, STEVEN V. W. Particle Emissivity in Circumstellar Disks. *Steven V. W. Beckwith & Anneila I. Sargent.* 381, 250, 192-B1 (1991)
- BEER, HERMANN. Capture Cross Section Measurements of Krypton and Xenon Isotopes and the Fundamental Parameters of the  $s$ -Process. *Hermann Beer.* 375, 823, 122-G7 (1991)
- An Analytical Formulation of the Double-Pulse  $s$ -Process Model. *Hermann Beer.* 379, 409, 168-B1 (1991)
- A Measurement of the  $^{22}\text{Ne}(n, \gamma)^{23}\text{Ne}$  Capture Cross Section at a Stellar Temperature of  $kT = 25$  keV. *Hermann Beer, G. Rupp, F. Voss, & F. Käppeler.* 379, 420, 168-C1 (1991)
- BEERS, TIMOTHY C. Detection of a Galactic Color Gradient for Blue Horizontal-Branch Stars of the Halo Field and Implications for the Halo Age and Density Distributions. *George W. Preston, Stephen A. Shectman, & Timothy C. Beers.* 375, 121, 112-E1 (1991)
- Photoelectric *UBV* Photometry of Stars Selected in the HK Objective-Prism Survey. *George W. Preston, Stephen A. Shectman, & Timothy C. Beers.* 76, 1001, 38-G5 (1991)
- Bound Populations around cD Galaxies and cD Velocity Offsets in Clusters of Galaxies. *Karl Gebhardt & Timothy C. Beers.* 383, 72, 213-A1 (1991)
- BEGELMAN, MITCHELL C. Consequences of Relativistic Proton Injection in Active Galactic Nuclei: Erratum. *Mitchell C. Begelman, Bronislaw Rudak, & Marek Sikora.* 370, 791, 58-D1 (1991) (Orig. paper in 362, 38, 169-E3 (1990))
- Cosmic-Ray Heating of Cooling Flows: A Critical Analysis. *Michael Loewenstein, Ellen G. Zweibel, & Mitchell C. Begelman.* 377, 392, 144-F4 (1991)
- Asymptotic Structure of Hydromagnetically Driven Relativistic Winds. *Tzihong Chiueh, Zhi-yun Li, & Mitchell C. Begelman.* 377, 462, 145-D11 (1991)
- Outflows Driven by Cosmic-Ray Pressure in Broad Absorption Line QSOs. *Mitchell C. Begelman, Martijn de Kool, & Marek Sikora.* 382, 416, 206-F9 (1991)
- BEICHMAN, C. A. What COBE Might See: The Far-Infrared Cosmological Background. *C. A. Beichman & G. Helou.* 370, L1, 53-B1 (1991)
- BEICHMAN, CHARLES A. Near-Infrared Emission-Line Images of Three Herbig-Haro Objects. *Karl R. Stapelfeldt, Charles A. Beichman, J. Jeff Hester, Nicholas Z. Scoville, & Thomas N. Gautier III.* 371, 226, 63-A1 (1991)
- BELL, K. R. Nonlinear Evolution of Accretion Disks Induced by Radiative Feedback Processes. *K. R. Bell, D. N. C. Lin, & Steven P. Ruden.* 372, 633, 83-E7 (1991)
- BELL, M. B. Detection of  $^{13}\text{C}$  Isotopomers of  $\text{HC}_3\text{N}$  ( $J = 9-8$ ) in the Circumstellar Envelope of IRC +10216. *M. B. Bell & P. A. Feldman.* 367, L33, 17-E8 (1991)
- BELL, R. A. Abundances in the Red Giants of M13 and M22. *M. D. Lehnert, R. A. Bell, & J. G. Cohen.* 367, 514, 19-F9 (1991)
- C and N Abundances among 47 Tucanae Main-Sequence Stars. *Michael M. Briley, James E. Hesser, & R. A. Bell.* 373, 482, 94-A1 (1991)
- BELY, PIERRE Y. The Imaging Performance of the *Hubble Space Telescope*. *Christopher J. Burrows, Jon A. Holtzman, S. M. Faber, Pierre Y. Bely, Hashima Hasan, C. R. Lynds, & Daniel Schroeder.* 369, L21, 45-C1 (1991)
- BELY-DUBAU, F. The O VII Soft X-Ray Spectrum and Its Application to Hot Plasmas in Astrophysics. *A. H. Gabriel, F. Bely-Dubau, P. Faucher, & L. W. Acton.* 378, 438, 156-D1 (1991)
- BENCIVENNI, D. The Galactic Globular Cluster System: Theoretical Constraints for  $\alpha$ -enhanced Compositions. *D. Bencivenni, F. Caputo, M. Manteiga, & M. L. Quarta.* 380, 484, 184-C1 (1991)
- BENCKE, M. V. A Radio-quiet Galaxy at Redshift  $z = 3.409$ . *D. A. Turnshek, F. Macchetto, M. V. Bencke, C. Hazard, W. B. Sparks, & R. G. McMahon.* 382, 26, 200-D1 (1991)
- BENDER, P. L. Gravitational Radiation from the Galaxy. *D. Hils, P. L. Bender, & R. E. Webbbink.* 369, 271, 39-C9 (1991) (Orig. paper in 360, 75, 146-A6 (1990))
- BENDINELLI, O. Abel Integral Equation Inversion and Deconvolution by Multi-Gaussian Approximation. *O. Bendinelli.* 366, 599, 10-D11 (1991)

- BENEDICT, G. F. See FRANZ, O. G., et al. Binary Star Observations with the *Hubble Space Telescope* Fine Guidance Sensors. I. ADS 11300.
- BENFORD, GREGORY. A Slingshot Model for Solar Flares. *Gregory Benford*. 373, 671, 96-C9 (1991)
- Coherent Radiation from Energetic Electron Streams via Collisionless Bremsstrahlung in Strong Plasma Turbulence. *James C. Weatherall & Gregory Benford*. 378, 543, 159-B8 (1991)
- BENNETT, C. L. A Search for vibrationally excited H<sub>2</sub>O at 68 GHz. *S. J. Petuchowski & C. L. Bennett*. 367, 168, 14-B4 (1991)
- See SMOOT, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a 7° Beam by the *Cosmic Background Explorer* (COBE).
- BENNETT, DAVID P. See GRIEST, KIM, et al. Gravitational Microlensing as a Method of Detecting Disk Dark Matter and Faint Disk Stars.
- BENSON, P. J. Dense Cores in Dark Clouds. VI. Shapes. *P. C. Myers, G. A. Fuller, A. A. Goodman, & P. J. Benson*. 376, 561, 133-D1 (1991)
- BENZ, W. Stellar Encounters Involving Red Giants in Globular Cluster Cores. *M. B. Davies, W. Benz, & J. G. Hills*. 381, 449, 196-C7 (1991)
- BENZ, WILLY. Hydrodynamical Instabilities and Mixing in SN 1987A: Two-dimensional Simulations of the First 3 Months. *Marc Herant & Willy Benz*. 370, L81, 59-D6 (1991)
- Fragmentation of Elongated Cylindrical Clouds. III. Formation of Binary and Multiple Systems. *Ian Bonnell, Hugo Martel, Pierre Bastien, Jean-Pierre Arcoragi, & Willy Benz*. 377, 553, 146-E5 (1991)
- Fragmentation of Elongated Cylindrical Clouds. I. Isothermal Clouds. *Pierre Bastien, Jean-Pierre Arcoragi, Willy Benz, Ian Bonnell, & Hugo Martel*. 378, 255, 154-B5 (1991)
- Dynamics of Cooling Gas in Galactic Dark Halos. *Julio F. Navarro & Willy Benz*. 380, 320, 182-C7 (1991)
- Fragmentation of Elongated Cylindrical Clouds. II. Polytropic Clouds. *Jean-Pierre Arcoragi, Ian Bonnell, Hugo Martel, Willy Benz, & Pierre Bastien*. 380, 476, 184-B7 (1991)
- BERGERON, P. Synthetic Spectra and Atmospheric Properties of Cool DA White Dwarfs. *P. Bergeron, F. Wesemael, & G. Fontaine*. 367, 253, 15-C1 (1991)
- The Isolated Massive DA White Dwarf GD 50. *P. Bergeron, K. M. Kidder, J. B. Holberg, James Liebert, F. Wesemael, & Rex A. Saffer*. 372, 267, 77-CS (1991)
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- Discovery and Seismological Interpretation of Low-Amplitude Modes in the Pulsating DO White Dwarf PG 1707+427 (V817 Herculis). *G. Fontaine, P. Bergeron, G. Vauclair, P. Brassard, F. Wesemael, S. D. Kawaler, A. D. Grauer, & D. E. Winget*. 378, L49, 162-F1 (1991)
- BERK, H. L. Magnetically Driven Jets and Winds. *R. V. E. Lovelace, H. L. Berk, & J. Contopoulos*. 379, 696, 173-D1 (1991)
- BERLEY, D. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- BERNATOWICZ, THOMAS J. Interstellar Grains within Interstellar Grains. *Thomas J. Bernatowicz, Sachiko Amari, Ernst K. Zinner, & Roy S. Lewis*. 373, L73, 97-E10 (1991)
- BERNSTEIN, G. The Clustering of Faint Galaxies. *G. Efstathiou, G. Bernstein, N. Katz, J. A. Tyson, & P. Guhathakurta*. 380, L47, 188-B1 (1991)
- BERRINGTON, K. A. Effective Collision Strengths among Fine-Structure Levels of Ca XV: Erratum. *K. M. Aggarwal, K. A. Berrington, & F. P. Keenan*. 77, 441, 50-F1 (1991)
- Improved Line Ratio Calculations Involving  $\Delta n = 1$  (2-3) Transitions in O V and a Reanalysis of *Skylab* Observations of Solar Flares. *F. P. Keenan, P. L. Dufton, L. K. Harra, E. S. Conlon, K. A. Berrington, A. E. Kingston, & K. G. Widing*. 382, 349, 204-E1 (1991)
- BERSANELLI, MARCO. The Temperature of the Cosmic Microwave Background Radiation at 3.8 GHz: Results of a Measurement from the South Pole Site. *Giovanni De Amici, Marco Bersanelli, Al Kotog, Steve Levin, Michele Limon, & George F. Smoot*. 381, 341, 193-C1 (1991)
- BERTOLA, F. Triaxiality in Disk Galaxies. *F. Bertola, M. Vietri, & W. W. Zeilinger*. 374, L13, 103-D1 (1991)
- See WINDHORST, ROGIER A., et al. The Discovery of a Young Radio Galaxy at  $z = 2.390$ : Probing Initial Star Formation at  $z \lesssim 3.0$ .
- BERTOLA, FRANCESCO. Testing the Gravitational Field in Elliptical Galaxies: NGC 5077. *Francesco Bertola, Daniela Bettini, John Danziger, Elaine Sadler, Linda Sparke, & Tim de Zeeuw*. 373, 369, 92-E10 (1991)
- BERTOUT, CLAUDE. The Vertical Structure of T Tauri Accretion Disks. I. Heating by the Central Star. *Fabien Malbet & Claude Bertout*. 383, 814, 224-D1 (1991)
- BERTRAM, D. The Distribution of Dark Matter in the Perseus Cluster. *C. J. Eyles, M. P. Watt, D. Bertram, M. J. Church, T. J. Ponman, G. K. Skinner, & A. P. Willmore*. 376, 23, 125-C12 (1991)
- BERTRAM, R. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- Optical Identification of the X-Ray Source GS 2023+338 as V404 Cygni. *R. Mark Wagner, Sumner G. Starrfield, Steve B. Howell, Tobias J. Kreidl, S. J. Bus, A. Cassatella, R. Bertram, & R. Fried*. 378, 293, 154-E10 (1991)
- BERTSCHINGER, EDMUND. Seeded Hot Dark Matter Models for Large-Scale Structure. *Jens V Villumsen, Robert J. Scherrer, & Edmund Bertschinger*. 367, 37, 12-D11 (1991)
- Comparison of Likely Candidate Models for Abell Cluster Structures against the Observed Distribution. *David J. Batuski, Adrian L. Melott, Robert J. Scherrer, & Edmund Bertschinger*. 367, 393, 18-C11 (1991)
- Cosmological Velocity-Density Relation in the Quasi-linear Regime. *Adi Nusser, Avishai Dekel, Edmund Bertschinger, & George R. Blumenthal*. 379, 6, 163-B7 (1991)
- Statistics of Primordial Density Perturbations from Discrete Seed Masses. *Robert J. Scherrer & Edmund Bertschinger*. 381, 349, 195-B1 (1991)
- Seeded Hot Dark Matter Models for Large-Scale Structure: Erratum. *Jens V Villumsen, Robert J. Scherrer, & Edmund Bertschinger*. 381, 601, 198-C1 (1991) (Orig. paper in 367, 37, 12-D11 (1991))
- BESPAKOV, P. A. Consequences of Strong Pitch-Angle Diffusion of Particles in Solar Flares. *P. A. Bespalov, V. V. Zaitsev, & A. V. Stepanov*. 374, 369, 102-F5 (1991)
- BESSELL, MICHAEL S. Oxygen Abundances in Halo Stars. *Michael S. Bessell, Ralph S. Sutherland, & Kui Ruan*. 383, L71, 226-E6 (1991)
- BESTER, M. Distribution of Dust about  $\alpha$  Ceti and  $\alpha$  Orionis Based on 11 Micron Spatial Interferometry. *M. Bester, W. C. Danchi, C. G. De Giacomi, C. H. Townes, & T. R. Geballe*. 367, L27, 17-E1 (1991)
- BETTONI, DANIELA. Testing the Gravitational Field in Elliptical Galaxies: NGC 5077. *Francesco Bertola, Daniela Bettini, John Danziger, Elaine Sadler, Linda Sparke, & Tim de Zeeuw*. 373, 369, 92-E10 (1991)
- BETZ, A. L. Observations of  $^{12}\text{CO}$  and  $^{13}\text{CO}$   $J = 9-8$  in Galactic Molecular Clouds. *R. T. Boreiko & A. L. Betz*. 369, 382, 42-E1 (1991)
- Ionized Carbon in the Large Magellanic Cloud. *R. T. Boreiko & A. L. Betz*. 380, L27, 181-D9 (1991)
- BEUERMANN, K. See GIOMMI, P., et al. The EXOSAT High Galactic Latitude Survey.
- BEZHASTROV, V. G. Radiative Widths and Splitting of Cyclotron Lines in Superstrong Magnetic Fields. *G. G. Pavlov, V. G. Bezhastrov, P. Mészáros, & S. G. Alexander*. 380, 541, 185-A1 (1991)
- BHASKAR, R. Qualitative Explanations of Red Giant Formation. *R. Bhaskar & Anil Nigam*. 372, 592, 83-A10 (1991)
- BHAT, C. L. Possible Detection of TeV Gamma Rays from AM Herculis. *C. L. Bhat, R. K. Kaul, H. S. Rawat, V. K. Senecha, R. C. Rannat, M. L. Sapru, A. K. Tickoo, & H. Razdan*. 369, 475, 43-E12 (1991)
- BHATIA, A. K. N III Line Emission in Planetary Nebulae: Not Bowen Fluorescence. *S. O. Kastner & A. K. Bhatia*. 381, L59, 199-D7 (1991)

- BHATIA, RAJIV.** A Long-lasting Compact Group. *Fabio Governato, Rajiv Bhatia, & Guido Chincarini.* 371, L15, 66-C1 (1991)
- BHATTACHARJEE, A.** Current Sheet Formation and Rapid Reconnection in the Solar Corona. *A. Bhattacharjee & Xiangang Wang.* 372, 321, 78-A1 (1991)
- BICA, E.** Detection of the Helium Flash Gap in the Integrated ( $U - B$ ) versus ( $B - V$ ) Diagram for 624 Large Magellanic Cloud Clusters. *E. Bica, J. J. Clariá, H. Dottori, J. F. C. Santos, Jr., & A. Pianti.* 381, L51, 199-C7 (1991)
- Metal-rich Giant Branches of Bulge Clusters: Application to Color-Magnitude Diagrams of M31 and M32. *E. Bica, B. Barbuy, & S. Ortolani.* 382, L15, 205-B12 (1991)
- BIDA, THOMAS A.** High-Resolution Spectra of Solar Magnetic Features. II. Magnetic Fields of Umbral Brightenings. *Bruce W. Lites, Thomas A. Bida, A. Johannesson, & G. B. Schärmer.* 373, 683, 96-D11 (1991)
- BIEBER, JOHN W.** Solar Cycle Variation of the Interplanetary Magnetic Field Spiral. *Charles W. Smith & John W. Bieber.* 370, 435, 52-F4 (1991)
- Cosmic-Ray Diurnal Anisotropy, 1936-1988: Implications for Drift and Modulation Theories. *John W. Bieber & Jiahsing Chen.* 372, 301, 77-F4 (1991)
- BIEGING, J. H.** CO  $J = 3-2$  and  $J = 2-1$  Observations of NGC 7027. *P. A. Jaminet, W. C. Danchi, E. C. Sutton, A. P. G. Russell, Göran Sandell, J. H. Bieging, & D. Wilner.* 380, 461, 184-A4 (1991)
- BIEGING, JOHN H.** VLA Observations of 21 Centimeter H I Absorption toward Cassiopeia A. *John H. Bieging, W. Miller Goss, & Eric M. Wilcox.* 75, 999, 16-F5 (1991)
- The Molecular Envelope of NGC 7027. *John H. Bieging, David Wilner, & Harley A. Thronson, Jr.* 379, 271, 166-D9 (1991)
- BIEHLE, GARRETT T.** High-Mass Stars with Degenerate Neutron Cores. *Garrett T. Biehle.* 380, 167, 178-B9 (1991)
- BIÉMONT, E.** Accurate Oscillator Strengths of Astrophysical Interest for Neutral Oxygen. *E. Biémont, A. Hibbert, M. Godefroid, N. Voek, & B. C. Fawcett.* 375, 818, 122-G1 (1991)
- BIERMANN, PETER L.** Neutrino-heated Stars and Broad-Line Emission from Active Galactic Nuclei. *James MacDonald, Todor Stanev, & Peter L. Biermann.* 378, 30, 151-D4 (1991)
- BIETENHOLZ, M. F.** Faraday Rotation and Physical Conditions in the Crab Nebula. *M. F. Bietenholz & P. P. Kronberg.* 368, 231, 26-A1 (1991)
- The Expansion of the Crab Nebula. *M. F. Bietenholz, P. P. Kronberg, D. E. Hogg, & A. S. Wilson.* 373, L59, 97-D5 (1991)
- Does the Vela Pulsar Have "Wists"? *M. F. Bietenholz, D. A. Frail, & T. H. Hankins.* 376, L41, 137-C1 (1991)
- BILLER, S.** See **ALEXANDREAS, D. E.**, et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- BILLER, S. D.** Phase Coherence for TeV/PeV Binary Sources. *D. A. Lewis, R. C. Lamb, & S. D. Biller.* 369, 479, 43-F4 (1991)
- BIRKINSHAW, M.** A Measurement of the Value of the Hubble Constant from the X-Ray Properties and the Sunyaev-Zel'dovich Effect of Abell 665. *M. Birkinshaw, J. P. Hughes, & K. A. Arnaud.* 379, 466, 170-E1 (1991)
- BIRN, J.** Magnetic Field-aligned Electric Potentials in Nonideal Plasma Flows. *K. Schindler, M. Hesse, & J. Birn.* 380, 293, 179-G9 (1991)
- BISHT, P.** EXOSAT Observations of the X-Ray Source 2S 0114+65. *Krishna M. V. Apparao, P. Bisht, & K. P. Singh.* 371, 772, 71-B6 (1991)
- BISWAS, S.** Ionization States of the Anomalous Cosmic Rays. *R. K. Singh, Banasree Mitra, N. Durgaprasad, S. Biswas, M. N. Vahia, J. S. Yadav, A. Dutta, & J. N. Gowami.* 374, 753, 108-D7 (1991)
- BIVIANO, A.** The Luminosity-Diameter Relation for Disk Galaxies in Different Environments. *M. Girardi, A. Biviano, G. Giuricin, F. Mardirossian, & M. Mezzetti.* 366, 393, 7-F7 (1991)
- Arm Classification and Velocity Gradients in Spiral Galaxies. *A. Biviano, M. Girardi, G. Giuricin, F. Mardirossian, & M. Mezzetti.* 376, 458, 132-B7 (1991)
- BJÖRNSSON, GUNNL AUGUR.** A Recipe for Making Hot Accretion Disks. *Gunnlaugur Björnsson & Roland Svensson.* 371, L69, 73-C10 (1991)
- BJORAKER, GORDON L.** Detection of  $^{13}\text{C}$ -Ethane in Jupiter's Atmosphere. *Günther Wiedemann, Gordon L. Bjoraker, & Donald E. Jennings.* 383, L29, 219-D7 (1991)
- BJORKMAN, K. S.** On the Wind Geometry of the Wolf-Rayet Star EZ Canis Majoris. *R. E. Schulte-Ladbeck, K. H. Nordsieck, M. Taylor, M. A. Nook, K. S. Bjorkman, A. M. Magalhães, & C. M. Anderson.* 382, 301, 204-A1 (1991)
- See **TAYLOR, M.**, et al. First Ultraviolet Spectropolarimetry of Hot Supergiants.
- First Ultraviolet Spectropolarimetry of Be Stars from the Wisconsin Ultraviolet Photo-Polarimeter Experiment. *K. S. Bjorkman, K. H. Nordsieck, C. M. Anderson, B. L. Babler, G. C. Clayton, A. M. Magalhães, M. R. Meade, M. A. Nook, R. E. Schulte-Ladbeck, M. Taylor, & B. A. Whitney.* 383, L67, 226-E1 (1991)
- BLACK, JOHN H.** Electron Densities and the Excitation of CN in Molecular Clouds. *John H. Black & Ewine F. van Dishoeck.* 369, L9, 40-B5 (1991)
- Molecular Hydrogen Formation by Excited Atom Radiative Association. *William B. Latter & John H. Black.* 372, 161, 76-A4 (1991)
- BLADES, J. C.** An Ultraviolet Atlas of Quasar and Blazar Spectra. *A. L. Kinney, R. C. Bohlin, J. C. Blades, & D. G. York.* 75, 645, 10-C7 (1991)
- See **MACCHETTO, F.**, et al. First Results from the Faint Object Camera: Observations of PKS 0521-36.
- See **CRANE, P.**, et al. First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305.
- See **JAKOBSEN, P.**, et al. First Results from the Faint Object Camera: SN 1987A.
- See **PARESCHE, F.**, et al. First Results from the Faint Object Camera: Imaging the Core of Aquarius.
- See **MACCHETTO, F.**, et al. *HST* Observations of 3C 66B: A Double-stranded Optical Jet.
- See **ALBRECHT, R.**, et al. First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System.
- See **WEIGELT, G.**, et al. First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.
- BLADES, J. CHRIS.** Probing the Galactic Halo along the 3C 273 Sight Line Using IUE. *Geoffrey S. Burks, Donald G. York, J. Chris Blades, Ralph C. Bohlin, & Willem Wamsteker.* 381, 55, 189-F5 (1991)
- BLAES, O.** The Statistics of Slow Interstellar Accretion onto Neutron Stars. *O. Blaes & M. Rajagopal.* 381, 210, 191-E10 (1991)
- BLAIR, W. P.** See **FELDMAN, P. D.**, et al. Observations of Comet Levy (1990c) with the Hopkins Ultraviolet Telescope.
- See **MOOS, H. W.**, et al. Determination of Ionic Abundances in the Io Torus Using the Hopkins Ultraviolet Telescope.
- BLAIR, WILLIAM P.** A Detailed Optical Study of Kepler's Supernova Remnant. *William P. Blair, Knox S. Long, & Olaf Vancura.* 366, 484, 9-A1 (1991)
- W28 and 3C 400.2: Two Shell-like Radio Supernova Remnants with Centrally Peaked X-Ray Morphologies. *Knox S. Long, William P. Blair, Richard L. White, & Yutaka Matsui.* 373, 567, 95-A10 (1991)
- Far-Ultraviolet Mapping of the Cygnus Loop with the Voyager 2 Ultraviolet Spectrometer. *William P. Blair, Knox S. Long, Olaf Vancura, & J. B. Holberg.* 374, 202, 100-E5 (1991)
- Six Balmer-dominated Supernova Remnants. *R. Chris Smith, Robert P. Kirshner, William P. Blair, & P. Frank Winkler.* 375, 652, 120-G1 (1991)
- Faint Object Spectrograph Observations of the Low-Luminosity Seyfert Galaxy NGC 1566. *G. A. Kriss, G. F. Hartig, L. Armus, William P. Blair, S. Caganoff, & L. Dressel.* 377, L13, 143-C1 (1991)
- Discovery of a Fast Radiative Shock Wave in the Cygnus Loop Using the Hopkins Ultraviolet Telescope. *William P. Blair, Knox S. Long, Olaf Vancura, Charles W. Bowers, Arthur F. Davidsen, W. Van Dyke Dixon, Samuel T. Durrance, Paul D. Feldman, Henry C. Ferguson, Richard C. Henry, Randy A. Kimble, Gerard A. Kriss, Jeffrey W. Kruk, H. Warren Moos, & Theodore R. Gull.* 379, L33, 169-D1 (1991)
- See **LONG, KNOX S.**, et al. Spectroscopy of Z Camelopardalis in Outburst with the Hopkins Ultraviolet Telescope.

- See FERGUSON, HENRY C., et al. Constraints on the Origin of the Ultraviolet Upturn in Elliptical Galaxies from Hopkins Ultraviolet Telescope Observations of NGC 1399.
- BLAKE, GEOFFREY A. Molecular Line Survey of Sagittarius B2(M) from 330 to 355 GHz and Comparison with Sagittarius B2(N). *E. C. Sutton, P. A. Jaminet, W. C. Danchi, & Geoffrey A. Blake.* 77, 255, 47-F1 (1991)
- BLANCO, ARMANDO. Hydrogenated Amorphous Carbon Grains and the 2175 Å Interstellar Hump. *Armando Blanco, Ezio Bussoletti, Luigi Colangeli, Sergio Fonti, & John R. Stephens.* 382, L97, 211-E8 (1991)
- BLANCO, PHILIP R. Infrared Spectroscopy of Cygnus A: Implications for the Obscured Active Nucleus. *Martin J. Ward, Philip R. Blanco, Andrew S. Wilson, & Minoru Nishida.* 382, 115, 201-E11 (1991)
- BLANDFORD, ROGER D. Formation and Distortion of Optical Rings around Rich Cluster Galaxies. *Christopher S. Kochanek & Roger D. Blandford.* 375, 492, 118-G11 (1991)
- Bounds on Intergalactic Compact Objects from Observations of Compact Radio Sources. *Aggeliki Kassiola, Israel Kovner, & Roger D. Blandford.* 381, 6, 189-B4 (1991)
- Microlensing and the Structure of Active Galactic Nucleus Accretion Disks. *Kevin P. Rauch & Roger D. Blandford.* 381, L39, 199-B1 (1991)
- BLAND-HAWTHORN, JONATHAN. Ultramassive ( $\sim 10^{11} M_{\odot}$ ) Dark Core in the Luminous Infrared Galaxy NGC 6240? *Jonathan Bland-Hawthorn, Andrew S. Wilson, & R. Brent Tully.* 371, L19, 66-C7 (1991)
- Imaging Spectrophotometry of Ionized Gas in NGC 1068. II. Global Ionization of the Inner Disk. *Jonathan Bland-Hawthorn, James Sokolowski, & Gerald Cecil.* 375, 78, 112-A1 (1991)
- Imaging Spectrophotometry of Ionized Gas in NGC 1068. III. Anisotropic Excitation of the Large-Scale Disk by Scattering of Nuclear Continuum. *James Sokolowski, Jonathan Bland-Hawthorn, & Gerald Cecil.* 375, 583, 120-A1 (1991)
- BLASKIEWICZ, M. A Relativistic Model of Pulsar Polarization. *M. Blaskiewicz, J. M. Cordes, & I. Wasserman.* 370, 643, 56-D9 (1991)
- BLITZ, LEO. The Shape of the Galaxy. *Leo Blitz & David N. Spergel.* 370, 205, 49-F11 (1991)
- Direct Evidence for a Bar at the Galactic Center. *Leo Blitz & David N. Spergel.* 379, 631, 172-E1 (1991)
- BLIZZARD, PAULA. Upper Limit on Interstellar Gas in Coma Cluster Ellipticals. *Claude R. Canizares & Paula Blizzard.* 382, 79, 201-B1 (1991)
- BLOCH, J. J. Limits on the Density of Neutral Gas within 100 Parsecs from Observations of the Soft X-Ray Background. *M. Juda, J. J. Bloch, B. C. Edwards, D. McCammon, W. T. Sanders, S. L. Snowden, & J. Zhang.* 367, 182, 14-C8 (1991)
- BLONDIN, JOHN M. Enhanced Winds and Tidal Streams in Massive X-Ray Binaries. *John M. Blondin, Ian R. Stevens, & Timothy R. Kallman.* 371, 684, 70-B1 (1991)
- BLUMENTHAL, G. R. Do Clusters of Galaxies Affect the Spectrum of the Microwave Background? *M. Markevitch, G. R. Blumenthal, W. Forman, C. Jones, & R. A. Sunyaev.* 378, L33, 162-D1 (1991)
- BLUMENTHAL, GEORGE R. Fuzzy Correlations of Gamma-Ray Bursts. *Dieter H. Hartmann, Eric V. Linder, & George R. Blumenthal.* 367, 186, 14-D1 (1991)
- Cosmological Velocity-Density Relation in the Quasi-linear Regime. *Adi Nusser, Avishai Dekel, Edmund Bertschinger, & George R. Blumenthal.* 379, 6, 163-B7 (1991)
- BOCHKAREV, N. G. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- BODENHEIMER, PETER. Double Core Evolution. IV. The Late Stages of Evolution of a  $2 M_{\odot}$  Red Giant with a  $1 M_{\odot}$  Companion. *Ronald E. Taam & Peter Bodenheimer.* 373, 246, 89-A10 (1991)
- BODO, G. The Finite-Amplitude Behavior of the Joule Mode under Astrophysical Conditions. *G. Bodo, S. Massaglia, R. Rosner, & A. Ferrari.* 370, 398, 52-C1 (1991)
- BOHM, K. H. Spectroscopic Study of Direct and Dust-scattered Line Emission in the HH 1-HH 2 System. *J. Solf & K. H. Böhm.* 375, 618, 120-D3 (1991)
- BOHM, K.-H. The Ultraviolet Continuum and the Fluorescent H<sub>2</sub> Lines in Low-Excitation Herbig-Haro Objects. *K.-H. Böhm, D. M. Scott, & J. Solf.* 371, 248, 63-C1 (1991)
- BOHM, KARL-HEINZ. Models for Light Scattering by Dust around Herbig-Haro Objects. *Alberto Noriega-Crespo, Nuria Calvet, & Karl-Heinz Böhm.* 379, 676, 173-B1 (1991)
- BOHM-VITENSE, ERIKA. Heating Mechanism(s) for Transition Layers in Giants. *Erika Böhm-Vitense & José Mena-Werth.* 378, 718, 161-C8 (1991)
- BOESGAARD, ANN MERCHANT. Lithium, Age, and Metallicity in Open Clusters. *Ann Merchant Boesgaard.* 370, L95, 59-E12 (1991)
- BOGDAN, T. J. Scattering of Acoustic Waves from a Magnetic Flux Tube Embedded in a Radiating Fluid. *T. J. Bogdan & M. Knöller.* 369, 219, 38-F1 (1991)
- BOGDAN, THOMAS J. Multiple Scattering of Acoustic Waves by a Pair of Uniformly Magnetized Flux Tubes. *Thomas J. Bogdan & David C. Fox.* 379, 758, 174-B10 (1991)
- BOGEY, M. Detection of Interstellar H<sub>3</sub>O<sup>+</sup>: A Confirming Line. *Alwyn Wootten, J. G. Mangum, B. E. Turner, M. Bogey, F. Boulanger, E. Combès, P. J. Encrernaz, & M. Gerin.* 380, L79, 188-E6 (1991)
- BOGESS, A. See HUTCHINGS, J. B., et al. First Results from the Goddard High-Resolution Spectrograph: Ultraviolet Spectra of a Starburst Knot in NGC 1068.
- First Results from the Goddard High-Resolution Spectrograph: Resolved Velocity and Density Structure in the  $\beta$  Pictoris Circumstellar Gas. *A. Bogess, Frederick C. Bruhweiler, C. A. Grady, Dennis C. Ebbets, Yoji Kondo, L. M. Trafton, John C. Brandt, & S. R. Heap.* 377, L49, 143-F1 (1991)
- BOGESS, N. W. See SMOOTH, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a 7° Beam by the *Cosmic Background Explorer* (COBE).
- BOHLIN, R. The Ultraviolet Absorption Spectrum of 3C 273. *J. N. Bahcall, B. T. Jannuzi, D. P. Schneider, G. F. Hartig, R. Bohlin, & V. Junkkarinen.* 377, L5, 143-B6 (1991)
- BOHLIN, R. C. An Ultraviolet Atlas of Quasar and Blazar Spectra. *A. L. Kinney, R. C. Bohlin, J. C. Blades, & D. G. York.* 75, 645, 10-C7 (1991)
- See CAGANOFF, S., et al. Faint Object Spectrograph Spectroscopy of Resolved Structure in the Nucleus of NGC 1068.
- BOHLIN, RALPH C. Simulated Optical Images of Galaxies at  $z \sim 1$  Using Ultraviolet Images of Nearby Galaxies. *Ralph C. Bohlin, Robert H. Cornett, Jesse K. Hill, Robert S. Hill, Wayne B. Landsman, Robert W. O'Connell, Susan G. Neff, Andrew M. Smith, & Theodore P. Stecher.* 368, 12, 23-C1 (1991)
- Faint Object Camera Observations of a Globular Cluster Nova Field. *Bruce Margon, Scott F. Anderson, Ronald A. Downes, Ralph C. Bohlin, & Peter Jakobsen.* 369, L71, 46-C1 (1991)
- Probing the Galactic Halo along the 3C 273 Sight Line Using IUE. *Geoffrey S. Burks, Donald G. York, J. Chris Blades, Ralph C. Bohlin, & Willem Wamsteker.* 381, 55, 189-F5 (1991)
- BOKSENBERG, A. See CRANE, P., et al. First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305.
- BOKSENBERG, A. See MACCHETTO, F., et al. First Results from the Faint Object Camera: Observations of PKS 0521-36.
- See JAKOBSEN, P., et al. First Results from the Faint Object Camera: SN 1987A.
- See PARESCHE, F., et al. First Results from the Faint Object Camera: Imaging the Core of R Aquarii.
- See MACCHETTO, F., et al. *HST* Observations of 3C 66B: A Double-stranded Optical Jet.
- See ALBRECHT, R., et al. First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System.
- See WEIGELT, G., et al. First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.
- The Ultraviolet Spectrum of NGC 4151 from 1978 to 1990: General Characteristics and Evolution. *M.-H. Ulrich, A. Boksenberg, G. E.*

- Bromage, J. Clavel, A. Elvius, M. V. Penston, G. C. Perola, & M. A. J. Snijders. 382, 483, 207-E7 (1991)
- BOLDT, E. A. Small-Scale Fluctuations and Angular Correlations of the X-Ray Background in the HEAO 1 A-2 Energy Band: Constraints on Clustering of X-Ray Sources. *J. M. Martín-Mirónes, G. De Zotti, E. A. Boldt, F. E. Marshall, L. Danese, A. Franceschini, & M. Persic.* 379, 507, 171-A4 (1991)
- BOLDT, ELIHU. Cross-Correlation of the X-Ray Background with Nearby Galaxies. *Keith Jahoda, Ofer Lahav, Richard F. Mushotzky, & Elihu Boldt.* 378, L37, 162-D7 (1991)
- BOLOGNA, G. See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- BOLTE, M. The Near-Infrared Spectra of Low-Mass X-Ray Binaries and Related Objects. *A. P. Cowley, P. C. Schmidke, D. Crampton, J. B. Hutchings, & M. Bolte.* 373, 228, 88-G1 (1991)
- BOLTE, M. J. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- BOLTE, MICHAEL. Photometric Binary Stars in Praesepe and the Search for Globular Cluster Binaries. *Michael Bolte.* 376, 514, 132-G1 (1991)
- BOLTON, C. T. Detection of Small-Amplitude Pulsations in HD 34656 (O7 II). *A. W. Fullerton, D. R. Gies, & C. T. Bolton.* 368, L35, 35-C1 (1991)
- BOND, D. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- BOND, HOWARD E. Subgiant CH Stars. II. Chemical Compositions and the Evolutionary Connection with Barium Stars. *R. Earle Luck & Howard E. Bond.* 77, 515, 51-G1 (1991)
- BOND, J. R. Cosmic Backgrounds from Primeval Dust. *J. R. Bond, B. J. Carr, & C. J. Hogan.* 367, 420, 18-F1 (1991)
- Excursion Set Mass Functions for Hierarchical Gaussian Fluctuations. *J. R. Bond, S. Cole, G. Efstathiou, & N. Kaiser.* 379, 440, 170-C1 (1991)
- BONELLI, G. The Brightness Temperature of the South Celestial Pole and the Temperature of the Cosmic Background Radiation Measured at 36.6 and 12 Centimeter Wavelength. *G. Sironi, G. Bonelli, & M. Limon.* 378, 550, 159-C1 (1991)
- BONNELL, IAN. The Collapse of Cylindrical Isothermal and Polytropic Clouds with Rotation. *Ian Bonnell & Pierre Bastien.* 374, 610, 106-F5 (1991)
- Fragmentation of Elongated Cylindrical Clouds. III. Formation of Binary and Multiple Systems. *Ian Bonnell, Hugo Martel, Pierre Bastien, Jean-Pierre Arcoragi, & Willy Benz.* 377, 553, 146-E5 (1991)
- Fragmentation of Elongated Cylindrical Clouds. I. Isothermal Clouds. *Pierre Bastien, Jean-Pierre Arcoragi, Willy Benz, Ian Bonnell, & Hugo Martel.* 378, 255, 154-B5 (1991)
- Fragmentation of Elongated Cylindrical Clouds. II. Polytropic Clouds. *Jean-Pierre Arcoragi, Ian Bonnell, Hugo Martel, Willy Benz, & Pierre Bastien.* 380, 476, 184-B7 (1991)
- BONNET-BIDAUD, J. M. X-Ray to Infrared Observations of the AM Herculis System E1405-451 (V834 Centauri). *R. M. Sambruna, L. Chiappetti, A. Treves, J. M. Bonnet-Bidaud, P. Bouchet, L. Maraschi, C. Motch, & M. Mouchet.* 374, 744, 108-C10 (1991)
- BONNOR, W. B. Models of Voids in the Expanding Universe. II. *W. B. Bonnor & A. Chamorro.* 378, 461, 158-B7 (1991)
- BONOMETTO, SILVIO A. Background Correlation Functions from Galaxy Rotation Curves. *Stefano Borgani, Silvio A. Bonometto, Massimo Persic, & Paolo Salucci.* 374, 20, 98-C7 (1991)
- BOOTHROYD, ARNOLD I. Mixing Length and Opacity Effects: Deep Convective Envelopes on the Asymptotic Giant Branch. *I. Julianne Sackmann & Arnold I. Boothroyd.* 366, 529, 9-E7 (1991)
- Our Sun. II. Early Mass Loss of  $0.1 M_{\odot}$  and the Case of the Missing Lithium. *Arnold I. Boothroyd, I. Julianne Sackmann, & William A. Fowler.* 377, 318, 141-G11 (1991)
- BOPP, B. Observations of the Peculiar Object MWC 560 in Outburst. *A. G. Michalitsianos, S. P. Maran, R. J. Oliversen, B. Bopp, E. Kontizas, A. Dapergolas, & M. Kontizas.* 371, 761, 71-A7 (1991)
- BOREIKO, R. T. Observations of  $^{12}\text{CO}$  and  $^{13}\text{CO}$   $J = 9-8$  in Galactic Molecular Clouds. *R. T. Boreiko & A. L. Betz.* 369, 382, 42-E1 (1991)
- Ionized Carbon in the Large Magellanic Cloud. *R. T. Boreiko & A. L. Betz.* 380, L27, 181-D9 (1991)
- BORGANI, STEFANO. Background Correlation Functions from Galaxy Rotation Curves. *Stefano Borgani, Silvio A. Bonometto, Massimo Persic, & Paolo Salucci.* 374, 20, 98-C7 (1991)
- BORKOWSKI, KAZIMIERZ J. A Grain-heated, Dusty Planetary Nebula in M22. *Kazimierz J. Borkowski & J. Patrick Harrington.* 379, 168, 165-B1 (1991)
- BORNE, KIRK D. A Merger Scenario for NGC 7252: A Tale of Two Tails. *Kirk D. Borne & Douglas O. Richstone.* 369, 111, 37-C11 (1991)
- Angular Momentum and Stripping in Tidal Interactions. *Thomas A. McGlynn & Kirk D. Borne.* 372, 31, 74-D7 (1991)
- BORNMANN, P. L. Interrelation of Soft and Hard X-Ray Emissions during Solar Flares. II. Simulation Model. *R. M. Winglee, G. A. Dulk, P. L. Bornmann, & J. C. Brown.* 375, 382, 115-F1 (1991)
- BOROSON, T. A. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- BOROSON, TODD A. The Appearance of a New Redshift System in Markarian 231. *Todd A. Boroson, Karie A. Meyers, Simon L. Morris, & S. E. Persson.* 370, L19, 53-D1 (1991)
- BORRA, ERMANNO F. The Case for a Liquid Mirror in a Lunar-based Telescope. *Ermanno F. Borra.* 373, 317, 89-G12 (1991)
- BORUTZKI, S. E. See KRISHER, T. P., et al. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of Voyager 2.
- BOSELLI, A. Large-Scale Peculiar Velocity Fields in Superclusters of Galaxies. *G. Gavazzi, M. Scoggio, A. Boselli, & G. Trinchieri.* 382, 19, 200-C5 (1991)
- BOTHUN, G. D. See MOULD, J. R., et al. The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. I. Southern Clusters.
- BOTHUN, GREGORY D. Extremely Low Surface Brightness Galaxies in the Fornax Cluster: Properties, Stability, and Luminosity Fluctuations. *Gregory D. Bothun, Christopher D. Impey, & David E. Malin.* 376, 404, 131-D10 (1991)
- A Numerical Study of Star Formation in Interacting Disk Galaxies. *J. Christopher Mihos, Douglas O. Richstone, & Gregory D. Bothun.* 377, 72, 139-A1 (1991)
- BOUCHET, F. R. Precollapse Scale Invariance in Gravitational Instability. *F. Moutarde, J.-M. Alimi, F. R. Bouchet, R. Pellat, & A. Ramani.* 382, 377, 206-C5 (1991)
- BOUCHET, FRANÇOIS R. Application of the Ewald Method to Cosmological N-Body Simulations. *Lars Hernquist, François R. Bouchet, & Yasushi Suto.* 75, 231, 4-B1 (1991)
- Cosmological N-Body Simulations with a Tree Code: Fluctuations in the Linear and Nonlinear Regimes. *Tatsuji Sugiyohara, Yasushi Suto, François R. Bouchet, & Lars Hernquist.* 75, 631, 10-B1 (1991)
- Nonlinear Matter Clustering Properties of a Cold Dark Matter Universe. *François R. Bouchet, Richard Schaeffer, & Marc Davis.* 383, 19, 212-C7 (1991)
- BOUCHET, L. SIGMA Discovery of Variable  $e^+e^-$  Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7-2942. *L. Bouchet, P. Mandrou, J. P. Roques, G. Vedrenne, B. Cordier, A. Goldwurm, F. Lebrun, J. Paul, R. Sunyaev, E. Churazov, M. Gilfanov, M. Pavlinsky, S. Grebenev, G. Balayan, I. Dekhanov, & N. Khavenson.* 383, L45, 226-C1 (1991)
- See SUNYAEV, R., et al. Three Spectral States of 1E 1740.7-2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature.
- BOUCHET, P. X-Ray to Infrared Observations of the AM Herculis System E1405-451 (V834 Centauri). *R. M. Sambruna, L. Chiappetti, A. Treves, J. M. Bonnet-Bidaud, P. Bouchet, L. Maraschi, C. Motch, & M. Mouchet.* 374, 744, 108-C10 (1991)
- BOUGHER, STEPHEN W. First Absolute Wind Measurements in the Middle Atmosphere of Mars. *Emmanuel Lellouch, Jeffrey J. Goldstein, Stephen W. Bougher, Gabriel Paubert, & Jan Rosenqvist.* 383, 401, 217-C5 (1991)

- BOUGHN, STEPHEN P. Large-Aperture *BVRJK* Photometry of Rich Abell Clusters: Constraints on Dark Matter. *Juan M. Uson & Stephen P. Boughn*. 369, 38, 36-D11 (1991)
- Diffuse Light in Dense Clusters of Galaxies. I. R-Band Observations of Abell 2029. *Juan M. Uson, Stephen P. Boughn, & Jeffrey R. Kuhn*. 369, 46, 36-E7 (1991)
- BOULANGER, F. Detection of Interstellar  $H_3O^+$ : A Confirming Line. *Alwyn Wootten, J. G. Mangum, B. E. Turner, M. Boley, F. Boulanger, F. Combes, P. J. Encrernaz, & M. Gerin*. 380, L79, 188-E6 (1991)
- BOULESTEIX, J. Superbubble Blowout in the Giant H II Region NGC 2363? *Jean-René Roy, J. Boulesteix, Gilles Joncas, & B. Grundseth*. 367, 141, 13-F8 (1991)
- BOWEN, G. H. From Wind to Windward: The Evolution of Mass-Loss Rates for Mira Models. *G. H. Bowen & L. A. Willson*. 375, L53, 124-C1 (1991)
- BOWEN, T. Measurement of Cosmic-Ray Proton and Helium Spectra during the 1987 Solar Minimum. *E. S. Seo, J. F. Ormes, R. E. Streitmatter, S. J. Stochaj, W. V. Jones, S. A. Stephens, & T. Bowen*. 378, 763, 161-G1 (1991)
- BOWERS, C. W. See FELDMAN, P. D., et al. Observations of Comet Levy (1990c) with the Hopkins Ultraviolet Telescope.
- See MOOS, H. W., et al. Determination of Ionic Abundances in the Io Torus Using the Hopkins Ultraviolet Telescope.
- BOWERS, CHARLES W. See BLAIR, WILLIAM P., et al. Discovery of a Fast Radiative Shock Wave in the Cygnus Loop Using the Hopkins Ultraviolet Telescope.
- See LONG, KNOX S., et al. Spectroscopy of Z Camelopardalis in Outburst with the Hopkins Ultraviolet Telescope.
- See FERGUSON, HENRY C., et al. Constraints on the Origin of the Ultraviolet Upturn in Elliptical Galaxies from Hopkins Ultraviolet Telescope Observations of NGC 1399.
- BOWERS, P. F. Kinematical Models of Maser Shells Formed by Aspherical Stellar Outflows (U Orionis; OH 231.8+4.2; Orion-IRc2). *P. F. Bowers*. 76, 1099, 40-G9 (1991)
- BOWYER, STUART. Spectral Observations of the Extreme Ultraviolet Background. *Simon E. Labov & Stuart Bowyer*. 371, 810, 71-F1 (1991)
- The Albedo and Scattering Phase Function of Interstellar Dust and the Diffuse Background at Far-Ultraviolet Wavelengths. *Mark Hurwitz, Stuart Bowyer, & Christopher Martin*. 372, 167, 76-A12 (1991)
- Spectroscopic Limits to an Extragalactic Far-Ultraviolet Background. *Christopher Martin, Mark Hurwitz, & Stuart Bowyer*. 379, 549, 171-D10 (1991)
- BOYD, CAMERON J. Continuum Polarization by Electron Scattering in Rotationally Distorted, Radiation-driven Stellar Winds: B[e] Supergiants. *Cameron J. Boyd & J. M. Marlborough*. 369, 191, 38-C11 (1991)
- BOYD, R. N. Primordial  ${}^4He$  as a Test of Big Bang Nucleosynthesis. *G. M. Fuller, R. N. Boyd, & J. D. Kalen*. 371, L11, 66-B7 (1991)
- Photoerosion and the Abundances of  ${}^7Li$ ,  ${}^9Be$ ,  ${}^{10}B$ , and  ${}^{11}B$  near Active Galactic Nuclei. *R. N. Boyd & H. S. Fencl*. 373, 84, 87-A13 (1991)
- Effects of Negatively Charged Massive Particles on Primordial Stars. *R. N. Boyd & G. M. Fuller*. 383, 615, 221-G12 (1991)
- BOYD, WILLIAM T. Star Formation in Taurus-Auriga: The High-Mass Stars. *Frederick M. Walter & William T. Boyd*. 370, 318, 51-C1 (1991)
- BOYLAN, M. B. Fe XIV Line Ratios in the Sun. *F. P. Keenan, P. L. Dufour, M. B. Boylan, A. E. Kingston, & K. G. Widing*. 373, 695, 96-E13 (1991)
- The  $3s^23p\ ^2P-3s3p\ ^2P$  Intercombination Lines of Fe XIV in the Sun. *F. P. Keenan, P. L. Dufour, E. S. Conlon, M. B. Boylan, A. E. Kingston, & K. G. Widing*. 379, 406, 168-A11 (1991)
- BOYLE, R. P. Asymmetries in the Atmosphere of Mira. *M. Karovska, P. Nisenson, C. Papaliolios, & R. P. Boyle*. 374, L51, 110-D1 (1991)
- BOYNTON, PAUL E. Decrease in the Orbital Period of Hercules X-1. *John E. Deeter, Paul E. Boynton, Sigenori Miyamoto, Shunji Kitamoto, Fumiaki Nagase, & Nobuyuki Kawai*. 383, 324, 216-C1 (1991)
- BRADLEY, A. J. See FRANZ, O. G., et al. Binary Star Observations with the *Hubble Space Telescope* Fine Guidance Sensors. I. ADS 11300.
- BRADLEY, M. Massive Black Holes in the Nuclei of Spiral Galaxies: M31 and the Problem of the Initial Conditions. *M. Bradley, A. Curia, & F. de Felice*. 381, 72, 189-G11 (1991)
- BRADLEY, P. A. Asteroseismology of White Dwarf Stars. I. Adiabatic Results. *P. A. Bradley & D. E. Winget*. 75, 463, 7-A13 (1991)
- See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- BRADSTREET, D. H. Analysis and Solution of the Light and Radial Velocity Curves of the Contact Binary TY Bootis. *E. F. Milone, G. Groisman, D. J. I. Fry, & D. H. Bradstreet*. 370, 677, 56-G5 (1991)
- BRADT, H. V. Ginga Observation of an AM Herculis Type Source H0538+608. *M. Ishida, A. Silber, H. V. Bradt, R. A. Remillard, K. Makishima, & T. Ohashi*. 367, 270, 15-D6 (1991)
- BRADT, HALE V. The X-Ray Cooling Flow in the Cluster of Galaxies around PKS 2354-35. *Daniel A. Schwartz, Hale V. Bradt, Ronald A. Remillard, & I. R. Tuohy*. 376, 424, 131-F6 (1991)
- BRAINERD, J. J. Dynamic Effects on Cyclotron Scattering in Pulsar Accretion Columns. *J. J. Brainerd & P. Mészáros*. 369, 179, 38-B11 (1991)
- The Inability of the Resonant Compton Upscattering Model of Gamma-Ray Bursts to Produce a Third Cyclotron Harmonic. *J. J. Brainerd*. 379, L57, 175-C1 (1991)
- BRANCH, DAVID. The Near-Maximum-Light Spectrum of the Type Ic Supernova 1987M. *David J. Jeffery, David Branch, Alexei V. Filippenko, & Ken-ichi Nomoto*. 377, L89, 150-D10 (1991)
- BRANDI, ESTELA. Wind Collision Effects in the Early-Type Close Binaries HD 47129 and AO Cassiopeiae. *Jorge Sahade & Estela Brandi*. 379, 706, 173-E1 (1991)
- BRANDT, JOHN C. First Results from the Goddard High-Resolution Spectrograph: Resolved Velocity and Density Structure in the  $\beta$  Pictoris Circumstellar Gas. *A. Boggess, Frederick C. Bruhweiler, C. A. Grady, Dennis C. Ebbets, Yoji Kondo, L. M. Trafton, John C. Brandt, & S. R. Heap*. 377, L49, 143-F1 (1991)
- BRANDUARDI-RAYMONT, G. See GIOMMI, P., et al. The EXOSAT High Galactic Latitude Survey.
- BRASSARD, P. Adiabatic Properties of Pulsating DA White Dwarfs. I. The Treatment of the Brunt-Väisälä Frequency and the Region of Period Formation. *P. Brassard, G. Fontaine, E. Wesemael, S. D. Kawaler, & M. Tassoul*. 367, 601, 20-F11 (1991)
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- Discovery and Seismological Interpretation of Low-Amplitude Modes in the Pulsating DO White Dwarf PG 1707+427 (V817 Herculis). *G. Fontaine, P. Bergeron, G. Vauchair, P. Brassard, E. Wesemael, S. D. Kawaler, A. D. Grauer, & D. E. Winget*. 378, L49, 162-F1 (1991)
- BRAUN, D. C. Power Spectra of Solar Convection. *D.-Y. Chou, B. J. LaBonte, D. C. Braun, & T. L. Duval, Jr.* 372, 314, 77-G5 (1991)
- BRAUN, R. Relativistic Electron Populations in Cassiopeia A. *M. Anderson, L. Rudnick, P. Leppik, R. Perley, & R. Braun*. 373, 146, 87-G4 (1991)
- BRAUN, ROBERT. The Distribution and Kinematics of Neutral Gas in M31. *Robert Braun*. 372, 54, 74-F6 (1991)
- BRECHT, S. H. Coronal Proton Transport in the Presence of Alfvén Waves and Implications for Gamma-Ray Burst Models. *D. F. Smith & S. H. Brecht*. 373, 289, 89-E9 (1991)
- BREGMAN, J. N. See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- BREGMAN, JOEL N. Stripped Interstellar Gas in Cluster Cooling Flows. *Noam Soker, Joel N. Bregman, & Craig L. Sarazin*. 368, 341, 29-C10 (1991)
- Interstellar Matter in Early-Type Galaxies. I. The Catalog. *Morton S. Roberts, David E. Hogg, Joel N. Bregman, William R. Forman, & Christine Jones*. 75, 751, 11-F5 (1991)
- BREKKE, P. An Ultraviolet Spectral Atlas of a Sunspot and an Active Region 1190-1730 Å. *P. Brekke, O. Kjeldseth-Moe, J.-D. F. Bartoe, & G. E. Brueckner*. 75, 1337, 23-C1 (1991)

- BRENNER, M. Rotational Evolution of Solar-Type Stars. I. Main-Sequence Evolution. *K. B. MacGregor & M. Brenner*. 376, 204, 127-D13 (1991)
- BRICKHILL, J. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- BRIDGER, A. See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- BRIEL, U. Extended X-Ray Emission in Nearby Seyfert Galaxies. *Martin Elvis, C. Fassnacht, A. S. Wilson, & U. Briel*. 371, 820, 71-F12 (1991) (Orig. paper in 361, 459, 163-G1 (1990))
- BRILEY, MICHAEL M. C and N Abundances among 47 Tucanae Main-Sequence Stars. *Michael M. Briley, James E. Hesser, & R. A. Bell*. 373, 482, 94-A1 (1991)
- BRINDLE, C. Optical and Near-Infrared Polarimetry of the Infrared Luminous Galaxy IRAS 23060+0505. *J. H. Hough, C. Brindle, Beverly J. Wills, D. Wills, & J. Bailey*. 372, 478, 81-F9 (1991)
- BRINK, C. No Evidence for TeV Gamma Radiation from 2CG 006-00. *H. I. Nel, B. C. Raubenheimer, O. C. de Jager, R. Buccheri, M. Busetta, A. R. North, & C. Brink*. 368, 585, 32-D4 (1991)
- BRINKMANN, W. X-Ray and Radio Pulse Phase Comparison for PSR 1509-58. *N. Kawai, R. Okuyasu, W. Brinkmann, R. Manchester, A. G. Lyne, & N. D'Amico*. 383, L65, 226-D12 (1991)
- BRISSENDEN, R. See GIOMMI, P., et al. The EXOSAT High Galactic Latitude Survey.
- BROADHURST, T. See SOIFER, B. T., et al. Near-Infrared Observations of the  $z \sim 2.3$  IRAS Source FSC 10214+4724.
- BROCK, DAVID. Dust Properties around Evolved Stars from Far-Infrared Size Limits. *Paul M. Harvey, Daniel F. Lester, David Brock, & Marshall Joy*. 368, 558, 32-A8 (1991)
- BRODIE, JEAN P. Extragalactic Globular Clusters. II. The M31 Globular Cluster System. *John P. Huchra, Jean P. Brodie, & Stephen M. Kent*. 370, 495, 54-E5 (1991)
- Extragalactic Globular Clusters. III. Metallicity Comparisons and Anomalies. *Jean P. Brodie & John P. Huchra*. 379, 157, 165-A1 (1991)
- BROMAGE, G. E. The Ultraviolet Spectrum of NGC 4151 from 1978 to 1990: General Characteristics and Evolution. *M.-H. Ulrich, A. Boksenberg, G. E. Bromage, J. Clavel, A. Elvius, M. V. Penston, G. C. Perola, & M. A. J. Snijders*. 382, 483, 207-E7 (1991)
- BROOKE, T. Y. A Sensitive Upper Limit on the Methane Abundance in Comet Levy (1990c). *T. Y. Brooke, A. T. Tokunaga, H. A. Weaver, G. Chin, & T. R. Geballe*. 372, L113, 85-G1 (1991)
- BROOKSHAW, LEIGH. Outflow Hydrodynamics in the Eclipsing Millisecond Pulsar Binaries PSR 1957+20 and PSR 1744-24A. *Marco Tavani & Leigh Brookshaw*. 381, L21, 194-C13 (1991)
- BROSCH, N. See MAOZ, D., et al. High-Rate Active Galaxy Monitoring at the Wise Observatory. III. The Broad-Line Region of NGC 4151.
- BROSUS, J. W. See NITTA, N., et al. Coronal Magnetic Structures Observing Campaign. I. Simultaneous Microwave and Soft X-Ray Observations of Active Regions at the Solar Limb.
- BROWN, ALEXANDER. X-Ray Emission from Hybrid-Chromosphere Stars. *Alexander Brown, Stephen A. Drake, Michael E. Van Steenberg, & Jeffrey L. Linsky*. 373, 614, 95-E9 (1991)
- First Results from the Goddard High-Resolution Spectrograph: The Chromosphere of  $\alpha$  Tauri. *Kenneth G. Carpenter, Richard D. Robinson, Glenn M. Wahlgren, Thomas B. Ake, Dennis C. Ebbets, Jeffrey L. Linsky, Alexander Brown, & Frederick M. Walter*. 377, L45, 143-E11 (1991)
- BROWN, J. C. Interrelation of Soft and Hard X-Ray Emissions during Solar Flares. II. Simulation Model. *R. M. Wingee, G. A. Dulk, P. L. Bornmann, & J. C. Brown*. 375, 382, 115-F1 (1991)
- BROWN, J. H. On the Formation of Globular Clusters. I. Dynamical Limits on Globular Cluster Metallicities. *J. H. Brown, A. Burkert, & James W. Truran*. 376, 115, 126-D1 (1991)
- BROWN, JEFFERY A. Carbon Isotope Ratios along the Giant Branch of M67. *Kalpana Krishnaswamy Gilroy & Jeffery A. Brown*. 371, 578, 68-F7 (1991)
- Abundances of Tc and Related Elements in Stars of Type M, MS, and S. *Andrew D. Vanture, George Wallerstein, Jeffery A. Brown, & Grant Bazar*. 381, 278, 192-D7 (1991)
- BROWN, JOHN C. Stellar Occultation of Polarized Light from Circumstellar Electrons. II. Flat Envelopes Viewed at Arbitrary Inclination. *Geoffrey K. Fox & John C. Brown*. 375, 300, 114-F1 (1991)
- Constraints on the Physical Properties of Optical Bullets in SS 433. *John C. Brown, Joseph P. Cassinelli, & George W. Collins II*. 378, 307, 154-G1 (1991)
- BROWN, LARRY. Discovery of a Ly $\alpha$  Galaxy near a Damped Ly $\alpha$  Absorber at  $z = 2.3$ . *James D. Lowenthal, Craig J. Hogan, Richard P. Green, Adeline Caulet, Bruce E. Woodgate, Larry Brown, & Craig B. Foltz*. 377, L73, 150-C1 (1991)
- BROWN, LAWRENCE E. The Shock Process and Light-Element Production in Supernova Envelopes. *Lawrence E. Brown, David S. Dearborn, David N. Schramm, Jon T. Larsen, & Shin Kurokawa*. 371, 648, 69-F1 (1991)
- BROWN, P. J. F. IUE Observations of Early-Type Stars at High Galactic Latitudes. *D. A. Quin, P. J. F. Brown, E. S. Conlon, P. L. Dufton, & F. P. Keenan*. 375, 342, 115-B7 (1991)
- BROWN, RONALD D. Pumping the Interstellar (6,3) Ammonia Maser. *Ronald D. Brown & Dinah M. Cragg*. 378, 445, 156-D10 (1991)
- See OHISHI, MASATOSHI, et al. Detection of a New Carbon-Chain Molecule, CCO.
- BROWN, TIMOTHY M. Detection of Possible  $p$ -Mode Oscillations on Procyon. *Timothy M. Brown, Ronald L. Gilliland, Robert W. Noyes, & Lawrence W. Ramsey*. 368, 599, 32-E8 (1991)
- The Source of Solar High-Frequency Acoustic Modes: Theoretical Expectations. *Timothy M. Brown*. 371, 396, 65-A5 (1991)
- BRUECKNER, G. E. An Ultraviolet Spectral Atlas of a Sunspot and an Active Region 1190-1730 Å. *P. Brekke, O. Kjeldseth-Moe, J.-D. E. Bartoe, & G. E. Brueckner*. 75, 1337, 23-C1 (1991)
- BRUENN, STEPHEN W. Neutrino-Nucleus Interactions in Core-Collapse Supernovae. *Stephen W. Bruenn & W. C. Haxton*. 376, 678, 134-G1 (1991)
- BRUGEL, E. New Low-Resolution Spectrometer Spectra for IRAS Sources. *Kevin Volk, Sun Kwok, R. E. Stencel, & E. Brugel*. 77, 607, 53-A1 (1991)
- BRUHWELLER, F. See HUTCHINGS, J. B., et al. First Results from the Goddard High-Resolution Spectrograph: Ultraviolet Spectra of a Starburst Knot in NGC 1068.
- BRUHWELLER, F. C. IUE Observations of NGC 1068: The Extremely Luminous Starburst Knots. *F. C. Bruhweller, K. Q. Truong, & B. Altner*. 379, 596, 172-B1 (1991)
- IUE Observations of NGC 1068: The Extended High-Ionization Emission Region. *K. Q. Truong & F. C. Bruhweller*. 379, 609, 172-C1 (1991)
- BRUHWELLER, FREDERICK C. A Search for Circumstellar Dust around HR 10, a Proposed  $\beta$  Pictoris Star. *Kwang-Ping Cheng, C. A. Grady, & Frederick C. Bruhweller*. 366, L87, 11-E7 (1991)
- The Circumstellar Disks of  $\beta$  Pictoris Analogs. *C. A. Grady, Frederick C. Bruhweller, K. P. Cheng, W. A. Chiu, & Y. Kondo*. 367, 296, 15-F9 (1991)
- A Large Supershell H II Region Complex in the Large Magellanic Cloud and the Interstellar Environment of SN 1987A. *Frederick C. Bruhweller, Michelle A. Fitzurka, & Theodore R. Gull*. 370, 551, 55-C9 (1991)
- Mass Outflow in the Nearby Proto-Planetary System  $\beta$  Pictoris. *Frederick C. Bruhweller, Yoji Kondo, & C. A. Grady*. 371, L27, 66-D7 (1991)
- Ultraviolet High-Excitation Fe II Fluorescence Lines Excited by O VI, C IV, and H I Resonance Emission As Seen in IUE Spectra. *Walter A. Feibelman, Frederick C. Bruhweller, & Sveneric Johansson*. 373, 649, 96-A8 (1991)
- Ultraviolet Fe VII Absorption and Fe II Emission Lines of Central Stars of Planetary Nebulae. *Kwang-Ping Cheng, Walter A. Feibelman, & Frederick C. Bruhweller*. 377, 235, 140-G7 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Resolved Velocity and Density Structure in the  $\beta$  Pictoris Circumstellar Gas. *A. Boggess, Frederick C. Bruhweller, C. A. Grady, Dennis C. Ebbets, Yoji Kondo, L. M. Trafton, John C. Brandt, & S. R. Heap*. 377, L49, 143-F1 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Element Abundances as a Function of Velocity in the Neutral Gas toward  $\xi$  Persei. *Blair D. Savage, Jason A. Cardelli, Frederick C.*

- Bruhwiler, Andrew M. Smith, Dennis C. Ebbets, & Kenneth R. Sembach.* 377, L53, 143-F6 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Elemental Abundances in the Diffuse Clouds toward  $\xi$  Persei. *Jason A. Cardelli, Blair D. Savage, Frederick C. Bruhwiler, Andrew M. Smith, Dennis C. Ebbets, Kenneth R. Sembach, & Ulysses J. Sofia.* 377, L57, 143-F11 (1991)
- First Results from the Goddard High-Resolution Spectrograph: C I, S I, and CO toward  $\xi$  Persei and the Physical Conditions in Diffuse Clouds. *Andrew M. Smith, Frederick C. Bruhwiler, David L. Lambert, Blair D. Savage, Jason A. Cardelli, Dennis C. Ebbets, Cheng-Hsuan Lyu, & Yaron Sheffer.* 377, L61, 143-G1 (1991)
- BRUMMELL, NICHOLAS H. Turbulent Compressible Convection. *Fausto Cattaneo, Nicholas H. Brummell, Juri Toomre, Andrea Malagoli, & Neal E. Hurlbut.* 370, 282, 50-F10 (1991)
- BRUZUAL, A. Stellar Population Synthesis Revisited. *Stéphane Charlot & Gustavo Bruzual A.* 367, 126, 13-E5 (1991)
- BRYAN, GREG L. Energy Distributions of Symbiotic Novae. *Greg L. Bryan & Sun Kwock.* 368, 252, 26-C1 (1991)
- BUCCHERI, R. No Evidence for TeV Gamma Radiation from 2CG 006-00. *H. I. Nel, B. C. Raubenheimer, O. C. de Jager, R. Buccieri, M. Busetta, A. R. North, & C. Brink.* 368, 585, 32-D4 (1991)
- BUCH, V. Sticking Probability of H and D Atoms on Amorphous Ice: A Computational Study. *V. Buch & Q. Zhang.* 379, 647, 172-F7 (1991)
- BUCHLER, J. ROBERT. Periodic Stellar Pulsations: Stability Analysis and Amplitude Equations. *J. Robert Buchler, Paweł Moskalik, & Géza Kovács.* 380, 185, 178-D1 (1991)
- BUCKLEY, D. A. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- BUHL, DAVID. Discovery of a Doppler-limited CO Line in the Upper Mesosphere of Venus: A New Dynamical Probe. *David Buhl, Gordon Chin, & Jeffrey J. Goldstein.* 369, L17, 40-C1 (1991)
- BUONANNO, ROBERTO. Globular Cluster Mass Functions. *Harvey B. Richer, Gregory G. Fahrlman, Roberto Buonanno, Flavio Fusi Pecci, Leonard Searle, & Ian B. Thompson.* 381, 147, 190-G7 (1991)
- BURBRIDGE, E. M. See BEAVER, E. A., et al. Far-Ultraviolet Spectroscopy of the Quasar UM 675 with the Faint Object Spectrograph on the *Hubble Space Telescope*.
- BURBRIDGE, E. MARGARET. A Technique for Using Radio Jets as Extended Gravitational Lensing Probes. *Philipp P. Kronberg, Charles C. Dyer, E. Margaret Burbidge, & Vesa T. Junkkarinen.* 367, L1, 17-B1 (1991)
- BURBRIDGE, G. An Optical Catalog of Extragalactic Emission-Line Objects Similar to Quasi-stellar Objects. *A. Hewitt & G. Burbidge.* 75, 297, 5-A5 (1991)
- A Catalog of Absorption in the Spectra of Quasi-stellar Objects. *V. Junkkarinen, A. Hewitt, & G. Burbidge.* 77, 203, 47-B1 (1991)
- BURG, R. X-Ray Luminosity Functions of Clusters of Galaxies. *A. Cavaliere, R. Burg, & R. Giacconi.* 366, L61, 11-B1 (1991)
- The CfA Einstein Observatory Extended Deep X-Ray Survey. *F. A. Primini, S. S. Murray, J. Huchra, R. Schild, R. Burg, & R. Giacconi.* 374, 440, 104-E12 (1991)
- BURGARELLA, DENIS. Narrow-Band Imaging of the Inner R Aquarii Nebula: Further Evidence for Shock Excitation. *Denis Burgarella & Francesco Paresce.* 370, 590, 55-G1 (1991)
- BURGESS, A. A Critical Assessment of Electron Excitation between the  $2s^22p^2$  and  $2s2p^3$  Configurations of Mg $^{+6}$ . *A. Burgess, H. E. Mason, & J. A. Tully.* 376, 803, 136-D1 (1991)
- BURIGANA, C. Constraints on the Thermal History of the Universe from the Cosmic Microwave Background Spectrum. *C. Burigana, G. De Zotti, & L. Danese.* 379, 1, 163-B1 (1991)
- BURKE, B. F. First- and Second-Epoch VLBI Observations of the Gravitational Lens System 2016+112. *M. B. Heflin, M. V. Gorenstein, C. R. Lawrence, & B. F. Burke.* 378, 519, 158-G9 (1991)
- BURKE, BERNARD. The Fourth MIT-Green Bank 5 GHz Survey. *Mark Griffith, Glen Langston, Mike Heflin, Sam Conner, & Bernard Burke.* 75, 801, 12-C5 (1991)
- BURKE, V. M. Ne v in Planetary Nebulae. *F. P. Keenan, V. M. Burke, & K. M. Aggarwal.* 371, 636, 69-D13 (1991)
- BURKERT, A. On the Formation of Globular Clusters. I. Dynamical Limits on Globular Cluster Metallicities. *J. H. Brown, A. Burkert, & James W. Truran.* 376, 115, 126-D1 (1991)
- BURKS, GEOFFREY S. Probing the Galactic Halo along the 3C 273 Sight Line Using IUE. *Geoffrey S. Burks, Donald G. York, J. Chris Blades, Ralph C. Bohlin, & William Warmsteker.* 381, 55, 189-F5 (1991)
- BURMAN, R. L. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- BURNARD, DAVID J. Accretion Powered Pulsars: Continuum Spectra and Light Curves of Settling Accretion Mounds. *David J. Burnard, Jonathan Arons, & Richard J. Klein.* 367, 575, 20-D10 (1991)
- BURNS, JACK O. Numerical Simulations of a Restarting Jet. *David A. Clarke & Jack O. Burns.* 369, 308, 41-E4 (1991)
- Depolarization Asymmetry in the Quasar 3C 47. *Ilias Fermani, J. Patrick Leahy, Jack O. Burns, & John P. Basart.* 381, 63, 189-G1 (1991)
- BURROWS, ADAM. SN 1991T: Gamma-Ray Observatory's First Supernova? *Adam Burrows, Anurag Shankar, & Kenneth A. Van Riper.* 379, L7, 169-B1 (1991)
- BURROWS, CHRISTOPHER J. The Imaging Performance of the *Hubble Space Telescope*. *Christopher J. Burrows, Jon A. Holtzman, S. M. Faber, Pierre Y. Bely, Hashima Hasan, C. R. Lynds, & Daniel Schroeder.* 369, L21, 45-C1 (1991)
- BURROWS, DAVID N. Determination of Confidence Limits for Experiments with Low Numbers of Counts. *Ralph P. Kraft, David N. Burrows, & John A. Nousek.* 374, 344, 102-D1 (1991)
- BURSTEIN, DAVID. New Velocity Dispersions and Photometry for E and S0 Galaxies in the Great Attractor. *Alan Dressler, S. M. Faber, & David Burstein.* 368, 54, 23-G1 (1991)
- Galaxy Velocity Dispersions Using a Cross-Correlation Method: Erratum. *Cristina Dalle Ore, S. M. Faber, J. Jesús González, Roland Stoughton, & David Burstein.* 375, 427, 116-B12 (1991) (Orig. paper in 366, 38, 1-E5 (1991))
- See WINDHORST, ROGER A., et al. The Discovery of a Young Radio Galaxy at  $z = 2.390$ : Probing Initial Star Formation at  $z \lesssim 3.0$ .
- BURTON, MICHAEL G. Molecular Hydrogen Polarization Images of OMC-1. *Michael G. Burton, N. R. Minchin, J. H. Hough, C. Aspin, D. J. Axon, & J. A. Bailey.* 375, 611, 120-C9 (1991)
- BURYAK, OLGA E. Deep Galactic Surveys and the Structure of the Universe. *Olga E. Buryak, Marek Demiański, & Andrej G. Doroshkevich.* 383, 41, 212-E1 (1991)
- BUS, S. J. Optical Identification of the X-Ray Source GS 2023+338 as V404 Cygni. *R. Mark Wagner, Sumner G. Starrfield, Steve B. Howell, Tobias J. Kreidl, S. J. Bus, A. Cassatella, R. Bertram, & R. Fried.* 378, 293, 154-E10 (1991)
- BUSSETTA, M. No Evidence for TeV Gamma Radiation from 2CG 006-00. *H. I. Nel, B. C. Raubenheimer, O. C. de Jager, R. Buccieri, M. Busetta, A. R. North, & C. Brink.* 368, 585, 32-D4 (1991)
- BUSHOUSE, H. A. A Near-Infrared Imaging Survey of Interacting Galaxies: The Disk-Disk Merger Candidates Subset. *S. A. Stanford & H. A. Bushouse.* 371, 92, 61-C1 (1991)
- BUSON, L. M. See WINDHORST, ROGER A., et al. The Discovery of a Young Radio Galaxy at  $z = 2.390$ : Probing Initial Star Formation at  $z \lesssim 3.0$ .
- BUSS, RICHARD H., JR. The Mid-Infrared Spectrum of the Carbon Star HD 38218 and Its Possible Relation to Polycyclic Aromatic Hydrocarbons. *Richard H. Buss, Jr., A. G. G. M. Tielens, & Theodore P. Snow.* 372, 281, 77-D8 (1991)
- BUSSO, M. s-Process Nucleosynthesis in Massive Stars and the Weak Component. I. Evolution and Neutron Captures in a  $25 M_{\odot}$  Star. *C. M. Raiteri, M. Buss, R. Gallino, G. Picchio, & L. Pulone.* 367, 228, 14-G13 (1991)
- s-Process Nucleosynthesis in Massive Stars and the Weak Component. II. Carbon Burning and Galactic Enrichment. *C. M. Raiteri, M. Buss, R. Gallino, & G. Picchio.* 371, 665, 69-G6 (1991)
- BUSOLETTI, EZIO. Hydrogenated Amorphous Carbon Grains and the 2175 Å Interstellar Hump. *Armando Blanco, Ezio Busoletti, Luigi Colangeli, Sergio Fonti, & John R. Stephens.* 382, L97, 211-E8 (1991)
- BUTA, R. Weakly Barred Early-Type Ringed Galaxies. IV. The Double-ringed S0 $^{+}$  Galaxy NGC 7702. *R. Buta.* 370, 130, 48-F6 (1991)

- BUTLER, K. Echelle Spectroscopy of CD –41° 13967: The Young Central Star of a New Planetary Nebula. *James K. McCarthy, R. Michael Rich, S. R. Becker, K. Butler, D. Husfeld, & H. G. Groth.* 371, 380, 64-G1 (1991)
- See HEAP, S. R., et al. First Results from the Goddard High-Resolution Spectrograph: Spectroscopic Determination of Stellar Parameters of Melnick 42, an O3f Star in the Large Magellanic Cloud.
- BUTNER, HAROLD M. Testing Models of Low-Mass Star Formation: High-Resolution Far-Infrared Observations of L1551 IRS 5. *Harold M. Butner, Neal J. Evans II, Daniel F. Lester, Russell M. Levereault, & Stephen E. Strom.* 376, 636, 134-C6 (1991)
- CABRERA-CAÑO, JESÚS. Topography of the Galactic Disk: Z-Structure and Large-Scale Star Formation. *Emilio J. Alfaro, Jesús Cabrera-Canó, & Antonio J. Delgado.* 378, 106, 152-C10 (1991)
- CABRIT, SYLVIE. An Observational Connection between Circumstellar Disk Mass and Molecular Outflows. *Sylvie Cabrit & Philippe André.* 379, L25, 169-C6 (1991)
- CADITZ, DAVID M. Evolution of the Luminosity Function of Quasar Accretion Disks. *David M. Caditz, Vahé Petrosian, & Amri Wandel.* 372, L63, 85-C1 (1991)
- CADY, D. R. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- CAGANOFF, S. HST Imaging of the Inner 3 Arcseconds of NGC 1068 in the Light of [O III] λ5007. *I. N. Evans, H. C. Ford, A. L. Kinney, R. R. J. Antonucci, L. Armus, & S. Caganoff.* 369, L27, 45-C9 (1991)
- Faint Object Spectrograph Spectroscopy of Resolved Structure in the Nucleus of NGC 1068. *S. Caganoff, R. R. J. Antonucci, H. C. Ford, G. A. Kriss, G. Hartig, L. Armus, I. N. Evans, E. Rosenblatt, R. C. Bohlin, & A. L. Kinney.* 377, L9, 143-B11 (1991)
- Faint Object Spectrograph Observations of the Low-Luminosity Seyfert Galaxy NGC 1566. *G. A. Kriss, G. F. Hartig, L. Armus, William P. Blair, S. Caganoff, & L. Dressel.* 377, L13, 143-C1 (1991)
- CAILLAULT, JEAN-PIERRE. IUE Observations of Solar-Type Stars in the Pleiades and the Hyades. *Jean-Pierre Caillault, Osmi Vilhu, & Jeffrey L. Linsky.* 383, 594, 221-F1 (1991)
- CAILLOUX, MIREILLE. Spectroscopy of the Gravitational Arcs in Cl 2244–02, A370 (Arclet A5), and Cl 0024+1654. *Yannick Mellier, Bernard Fort, Geneviève Soucail, Guy Mathez, & Mireille Cailloux.* 380, 334, 182-D10 (1991)
- CALDWELL, JOHN A. R. Radial Velocities of 26 Northern Milky Way Cepheids. *Mark R. Metzger, John A. R. Caldwell, James K. McCarthy, & Paul L. Schechter.* 76, 803, 35-G3 (1991)
- CALDWELL, NELSON. A Study of Star Formation in the Disks of Sa Galaxies. *Nelson Caldwell, Robert Kennicutt, Andrew C. Phillips, & Robert A. Schommer.* 370, 526, 54-G12 (1991)
- CALLY, P. S. Stability, Structure, and Evolution of Cool Loops. *P. S. Cally & T. D. Robb.* 372, 329, 78-A11 (1991)
- CALVANI, M. The Effect of Anisotropic Emission from Thick Accretion Disks on the Luminosity Functions of Active Galactic Nuclei. *C. M. Urry, P. Marziani, & M. Calvani.* 371, 510, 67-G7 (1991)
- CALVET, NURIA. Models for Light Scattering by Dust around Herbig-Haro Objects. *Alberto Noriega-Crespo, Nuria Calvet, & Karl-Heinz Böhm.* 379, 676, 173-B1 (1991)
- Irradiation of Accretion Disks around Young Objects. I. Near-Infrared CO Bands. *Nuria Calvet, Alberto Patiño, Gladis Magris C., & Paola D'Alessio.* 380, 617, 185-G8 (1991)
- On the Near-Infrared Spectrum of FU Orionis. *Nuria Calvet, Lee Hartmann, & Scott J. Kenyon.* 383, 752, 223-E6 (1991)
- CAMERON, M. High-Resolution Imaging of Brackett-γ and H<sub>2</sub> 1–0 S(1) Emission in the Seyfert Galaxy NGC 1068. *V. Rotaciuc, A. Krabbe, M. Cameron, S. Drapatz, R. Genzel, A. Sternberg, & J. W. Storey.* 370, L23, 53-D6 (1991)
- The Molecular Interstellar Medium and the Near-Infrared Continuum of the Barred LINER NGC 6764. *A. Eckart, M. Cameron, J. M. Jackson, R. Genzel, A. I. Harris, W. Wild, & H. Zinnecker.* 372, 67, 74-G9 (1991)
- CAMERON, MURRAY. The Interstellar Medium of the Hot-Spot Galaxy NGC 2903. *James M. Jackson, Andreas Eckart, Murray Cameron, Wolfgang Wild, Paul T. P. Ho, Richard W. Pogge, & Andrew I. Harris.* 375, 105, 112-C9 (1991)
- CAMPBELL, B. G. Anatomy of the Barnard 5 Core. *G. A. Fuller, P. C. Myers, W. J. Welch, P. F. Goldsmith, W. D. Langer, B. G. Campbell, S. Guilloteau, & R. W. Wilson.* 376, 135, 126-E10 (1991)
- CAMPBELL, BEL. See HOLTZMAN, JON A., et al. Stellar Photometry with the *Hubble Space Telescope* Wide-Field/Planetary Camera: A Progress Report.
- See HESTER, J. JEFF, et al. Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0°.1.
- CAMPBELL, L. M. White Dwarf and Neutron Star Interior Solutions in the Nonsymmetric Gravitational Theory. *L. M. Campbell, J. W. Moffat, & P. Savaria.* 372, 241, 77-A1 (1991)
- CAMPINS, H. Infrared Mapping of M82: A Starburst in an Edge-on Barred Galaxy. *C. M. Telesco, H. Campins, M. Joy, K. Dietz, & R. Decher.* 369, 135, 37-E11 (1991)
- CANAL, R. SN 1988A in M58: Departure from <sup>56</sup>Co Decay 700 Days after Explosion. *P. Ruiz-Lapuente, M. Kidger, G. Gómez, R. Canal, & R. López.* 378, L41, 162-E1 (1991)
- CANAL, RAMON. The Outcome of Explosive Ignition of ONeMg Cores: Supernovae, Neutron Stars, or “Iron” White Dwarfs? *Jordi Isern, Ramon Canal, & Javier Labay.* 372, L83, 85-D9 (1991)
- CANE, H. V. Solar Particle Abundances at Energies Greater than 1 MeV per Nucleon and the Role of Interplanetary Shocks. *H. V. Cane, D. V. Reames, & T. T. von Rosenvinge.* 373, 675, 96-D1 (1991)
- Solar Gamma-Ray-Line Flares, Type II Radio Bursts, and Coronal Mass Ejections. *E. W. Cliver, H. V. Cane, D. J. Forrest, M. J. Koomen, R. A. Howard, & C. S. Wright.* 379, 741, 174-A2 (1991)
- CANFIELD, E. Luminosity Enhancement Factor for Thermal Comptonization and the Electron Energy Balance. *C. D. Dermer, E. P. Liang, & E. Canfield.* 369, 410, 42-G5 (1991)
- CANFIELD, R. C. Inferring Chromospheric Flare Heating from Hydrogen-Line Wings. *K. G. Gayley & R. C. Canfield.* 380, 660, 186-D1 (1991)
- CANFIELD, RICHARD C. A Study of Solar Flare Energy Transport Based on Coordinated Hα and X-Ray Observations. *Richard C. Canfield, Dominic M. Zarro, Jean-Pierre Wülser, & Brian R. Dennis.* 367, 671, 21-E11 (1991)
- CANIZARES, CLAUDE R. Upper Limit on Interstellar Gas in Coma Cluster Ellipticals. *Claude R. Canizares & Paula Blizzard.* 382, 79, 201-B1 (1991)
- CANNON, R. C. A Conjecture Regarding the Evolution of Dwarf Stars into Red Giants. *P. P. Eggleton & R. C. Cannon.* 383, 757, 223-E12 (1991)
- CANTÓ, J. Mixing Layers in Stellar Outflows. *J. Cantó & A. C. Raga.* 372, 646, 83-F7 (1991)
- CANTÓ, JORGE. A Double Radio Source at the Center of the Outflow in L723. *Guillem Anglada, Robert Estalella, Luis F. Rodríguez, José M. Torrelles, Rosario López, & Jorge Cantó.* 376, 615, 134-A7 (1991)
- CANUTO, SYLVIO. Theoretical Determination of the Spectroscopic Constants of the MgC Molecule. *Marcos A. Castro, Sylvio Canuto, & Florian Müller-Plathe.* 367, L69, 22-D3 (1991)
- Theoretical Studies of the Absorption Spectra of Polycyclic Aromatic Hydrocarbons. *Sylvio Canuto, Michael C. Zerner, & Geerd H. F. Diercksen.* 377, 150, 139-G3 (1991)
- CANUTO, V. M. Stellar Turbulent Convection: A New Model and Applications. *V. M. Canuto & I. Mazzitelli.* 370, 295, 51-A1 (1991)
- CAPACCIOLO, M. Is the Standard Elliptical NGC 3379 a Triaxial Disk Galaxy? *M. Capaccioli, M. Vietri, E. V. Held, & H. Lorenz.* 371, 535, 68-B12 (1991)
- CAPUTO, F. The Galactic Globular Cluster System: Theoretical Constraints for α-enhanced Compositions. *D. Bencivenni, F. Caputo, M. Manteiga, & M. L. Quarta.* 380, 484, 184-C1 (1991)
- CARDELLI, JASON A. First Results from the Goddard High-Resolution Spectrograph: Element Abundances as a Function of Velocity in the Neutral Gas toward ξ Persei. *Blair D. Savage, Jason A. Cardelli, Frederick C. Bruhweiler, Andrew M. Smith, Dennis C. Ebbets, & Kenneth R. Sembach.* 377, L53, 143-F6 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Elemental Abundances in the Diffuse Clouds toward ξ Persei. *Jason A. Cardelli, Blair D. Savage, Frederick C. Bruhweiler, Andrew M. Smith, Dennis C. Ebbets, Kenneth R. Sembach, & Ulysses J. Sofia.* 377, L57, 143-F11 (1991)

- First Results from the Goddard High-Resolution Spectrograph: C I, S I, and CO toward  $\zeta$  Persei and the Physical Conditions in Diffuse Clouds.** Andrew M. Smith, Frederick C. Bruhwiler, David L. Lambert, Blair D. Savage, Jason A. Cardelli, Dennis C. Ebbets, Cheng-Hsuan Lyu, & Yaron Shefer. 377, L61, 143-G1 (1991)
- Interstellar Environments Probed by Ca I Absorption and the Effects of Density-dependent Depletions.** Jason A. Cardelli, S. R. Federman, & V. V. Smith. 381, L17, 194-C7 (1991)
- Interstellar Gas Phase Abundance of Carbon, Oxygen, Nitrogen, Copper, Gallium, Germanium, and Krypton toward  $\zeta$  Ophiuchi.** Jason A. Cardelli, Blair D. Savage, & Dennis C. Ebbets. 383, L23, 219-D1 (1991)
- CARDONA, OCTAVIO.** Spectroscopic Binaries in the Orion Nebula Cluster. Helmut A. Abt, Ruyou Wang, & Octavio Cardona. 367, 155, 14-A1 (1991)
- CARGILL, P. J.** The Interaction of Collisionless Shocks in Astrophysical Plasmas. *P. J. Cargill*. 376, 771, 136-A1 (1991)
- CARIGNAN, CLAUDE.** H I Studies of the Sculptor Group Galaxies. VII. Implications on the Distribution and Nature of Dark Matter in Groups. Daniel Puche & Claude Carignan. 378, 487, 158-E1 (1991)
- The H I Content of the Local Group Dwarf (Spherical or Irregular?) Galaxy Phoenix.** Claude Carignan, Serge Demers, & Stéphanie Côté. 381, L13, 194-C1 (1991)
- CARILLI, C. L.** Multifrequency Radio Observations of Cygnus A: Spectral Aging in Powerful Radio Galaxies. C. L. Carilli, R. A. Perley, J. W. Dreher, & J. P. Leahy. 383, 554, 221-B9 (1991)
- CARINI, M. T.** See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- See EDELSON, R. A., et al. Rapid Ultraviolet Variability in the BL Lacertae Object PKS 2155-304.
- CARLBERG, R. G.** Dynamical Biases in Gravitational Clustering. R. G. Carlberg. 367, 385, 18-C1 (1991)
- Cluster Infall with Friction.** R. G. Carlberg & John Dubinski. 369, 13, 36-B11 (1991)
- A Limit on the Cosmological Constant.** R. G. Carlberg. 375, 429, 118-B1 (1991)
- The Accuracy of Galaxy Masses from the Timing Argument.** T. L. Kroeker & R. G. Carlberg. 376, 1, 125-B1 (1991)
- The Structure of Cold Dark Matter Halos.** John Dubinski & R. G. Carlberg. 378, 496, 158-E11 (1991)
- CARLETON, NATHANIEL P.** Infrared Broad Emission Lines from an Obscured Quasar, IRAS 23060+0505. Tadashi Nakajima, Nathaniel P. Carleton, & Minoru Nishida. 375, L1, 117-A7 (1991)
- CARLSTROM, J. E.** H II Regions in M82: High-Resolution Millimeter Continuum Observations. J. E. Carlstrom & Philipp P. Kronberg. 366, 422, 8-B1 (1991)
- Protostellar Condensations in the Core of NGC 2024.** D. C. Lis, J. E. Carlstrom, & T. G. Phillips. 370, 583, 55-F5 (1991)
- Millimeter Continuum Observations of Galactic Center Giant Molecular Cloud Cores.** D. C. Lis, J. E. Carlstrom, & Jocelyn Keene. 380, 429, 183-E7 (1991)
- CARONE, T. E.** See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- Absolute Far-Ultraviolet Spectrophotometry of Hot Subluminous Stars from Voyager.** J. B. Holberg, B. Ali, T. E. Carone, & R. S. Polidan. 375, 716, 121-E11 (1991)
- CARPENTER, KENNETH G.** First Results from the Goddard High-Resolution Spectrograph: The Chromosphere of  $\alpha$  Tauri. Kenneth G. Carpenter, Richard D. Robinson, Glenn M. Wahlgren, Thomas B. Ake, Dennis C. Ebbets, Jeffrey L. Linsky, Alexander Brown, & Frederick M. Walter. 377, L45, 143-E11 (1991)
- CARR, B. J.** Cosmic Backgrounds from Primeval Dust. J. R. Bond, B. J. Carr, & C. J. Hogan. 367, 420, 18-F1 (1991)
- Cosmic Rays from Primordial Black Holes.** Jane H. MacGibbon & B. J. Carr. 371, 447, 67-B5 (1991)
- CARR, J. S.** Discovery of Interstellar Methane: Observations of Gaseous and Solid  $\text{CH}_4$  Absorption toward Young Stars in Molecular Clouds. J. H. Lacy, J. S. Carr, Neal J. Evans II, F. Baas, J. M. Achtermann, & J. F. Arens. 376, 556, 133-C9 (1991)
- CARR, JOHN S.** An Optical/Infrared Outburst in the Exciting Source of HH 7-11. Jochen Eisloffel, Eike Günther, Frederic V. Hessman, Reinhard Mundt, Ralf Poetzel, John S. Carr, Steven Beckwith, & Tom P. Ray. 383, L19, 219-C7 (1991)
- Infrared Molecular Spectroscopy toward the Orion IRc2 and IRc7 Sources: A New Probe of Physical Conditions and Abundances in Molecular Clouds.** Neal J. Evans II, J. H. Lacy, & John S. Carr. 383, 674, 222-E13 (1991)
- CARROLL, SEAN M.** Interpreting Epsilon Aurigae. Sean M. Carroll, Edward F. Guinan, George P. McCook, & Robert A. Donahue. 367, 278, 15-E1 (1991)
- CARRUTHERS, P.** Galaxy Correlations, Counts, and Moments. *P. Carruthers*. 380, 24, 176-C11 (1991)
- CARSWELL, R. F.** High-Resolution Spectroscopy of Q1100-264 Again. R. F. Carswell, K. M. Lanzetta, H. C. Parnell, & J. K. Webb. 371, 36, 60-E1 (1991)
- The Systemic Redshift of the Quasar 1331+170.** R. F. Carswell, C. M. Mountain, D. J. Robertson, S. M. Beard, A. R. Glendinning, D. C. Laird, L. C. Lawrence, D. Montgomery, G. Pentland, D. A. Pickup, I. A. Smith, J. A. Bailey, A. Bridger, M. M. Casali, T. R. Geballe, P. Puxley, M. G. Smith, G. S. Wright, S. K. Ramsay, A. C. Baker, B. R. Espy, & M. J. Ward. 381, L5, 194-B1 (1991)
- CASALI, M. M.** See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- CASE, JAMES.** New Observations of the Gas Cloud Associated with the Quasar-Galaxy Pair 3C 232/NGC 3067. John T. Stocke, James Case, Megan Donahue, J. Michael Shull, & Theodore P. Snow. 374, 72, 98-G7 (1991)
- CASEY, S.** Far-Infrared and Submillimeter Wavelength Observations of Star-forming Dense Cores. II. Images. E. F. Ladd, Fred C. Adams, S. Casey, J. A. Davidson, G. A. Fuller, D. A. Harper, P. C. Myers, & R. Padman. 382, 555, 208-D7 (1991)
- CASEY, SEAN C.** Emission from Dust in Visual Reflection Nebulae at Infrared and Submillimeter Wavelengths. Sean C. Casey. 371, 183, 62-D1 (1991)
- CASSATELLA, A.** Multiwavelength Observations of Nova LMC 1990 Number 2: The First Extragalactic Recurrent Nova. Steven N. Shore, George Sonneborn, Sumner G. Starrfield, M. Hamuy, R. E. Williams, A. Cassatella, & H. Drechsel. 370, 193, 49-E8 (1991)
- Optical Identification of the X-Ray Source GS 2023+338 as V404 Cygni.** R. Mark Wagner, Sumner G. Starrfield, Steve B. Howell, Tobias J. Kreidl, S. J. Bus, A. Cassatella, R. Bertram, & R. Fried. 378, 293, 154-E10 (1991)
- CASSEN, PATRICK.** On the Evolution of Gravitationally Unstable Protostellar Disks. Leslie Tomley, Patrick Cassen, & Thomas Steiman-Cameron. 382, 530, 208-B6 (1991)
- CASSIDAY, G. L.** See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- CASSINELLI, J. P.** Wolf-Rayet Stars as Starting Points or as Endpoints of the Evolution of Massive Stars? H. J. G. L. M. Lamers, A. Maeder, W. Schmutz, & J. P. Cassinelli. 368, 538, 31-F12 (1991)
- Predicted Extreme-Ultraviolet Line Emission for Nearby Main-Sequence B Stars.** J. J. MacFarlane, J. P. Cassinelli, B. Y. Welsh, P. W. Vedder, J. V. Vallerga, & W. L. Waldron. 380, 564, 185-C1 (1991)
- CASSINELLI, JOSEPH P.** Constraints on the Physical Properties of Optical Bullets in SS 433. John C. Brown, Joseph P. Cassinelli, & Georg W. Collins II. 378, 307, 154-G1 (1991)
- CASTAGNOLI, C.** See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- CASTELLANI, MARCO.** Advanced Evolutionary Phases of Large-Metallicity Low-Mass Stars and the Problem of the Ultraviolet Excess of Elliptical Galaxies. Marco Castellani & Amedeo Tornambe. 381, 393, 195-E9 (1991)
- CASTELLANI, V.** The Evolution of He-burning Stars: Horizontal and Asymptotic Branches in Galactic Globulars. V. Castellani, A. Chieffi, & L. Pulone. 76, 911, 37-C5 (1991)
- CASTELLINA, A.** See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- CASTRO, MARCOS A.** Theoretical Determination of the Spectroscopic Constants of the MgC Molecule. Marcos A. Castro, Sylvio Canuto, & Florian Müller-Plathe. 367, L69, 22-D3 (1991)

- CATNEY, M. G. Spatial Structure of the Interstellar Gas toward the Globular Cluster M22. *B. Bates & M. G. Catney.* 371, L37, 66-E7 (1991)
- CATTANEO, FAUSTO. Turbulent Compressible Convection. *Fausto Cattaneo, Nicholas H. Brummell, Juri Toomre, Andrea Malagoli, & Neal E. Hurlbert.* 370, 282, 50-F10 (1991)
- Suppression of Turbulent Transport by a Weak Magnetic Field. *Fausto Cattaneo & Samuel I. Vainshtein.* 376, L21, 130-C6 (1991)
- CAULET, ADELINE. Discovery of a Ly $\alpha$  Galaxy near a Damped Ly $\alpha$  Absorber at  $z = 2.3$ . *James D. Lowenthal, Craig J. Hogan, Richard F. Green, Adeline Caulet, Bruce E. Woodgate, Larry Brown, & Craig B. Foltz.* 377, L73, 150-C1 (1991)
- CAVALIERE, A. X-Ray Luminosity Functions of Clusters of Galaxies. *A. Cavaliere, R. Burg & R. Giacconi.* 366, L61, 11-B11 (1991)
- BL Lacertae Objects and Radio-loud Quasars within an Evolutionary Unified Scheme. *F. Vagnetti, E. Giallongo, & A. Cavaliere.* 368, 366, 29-E1 (1991)
- The Merging Runaway. *A. Cavaliere, S. Colafrancesco, & N. Menci.* 376, L37, 137-B10 (1991)
- The Mass Distribution of Groups and Clusters of Galaxies. *A. Cavaliere, S. Colafrancesco, & R. Scaramella.* 380, 15, 176-C1 (1991)
- CAWLEY, M. F. See MACOMB, D. J., et al. Search for TeV Emission from 4U 0115+63.
- See VACANTI, G., et al. Gamma-Ray Observations of the Crab Nebula at TeV Energies.
- See AKERLOF, C. W., et al. Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy.
- See REYNOLDS, P. T., et al. Search for TeV Gamma-Ray Emission from Hercules X-1.
- CECIL, GERALD. Imaging Spectrophotometry of Ionized Gas in NGC 1068. II. Global Ionization of the Inner Disk. *Jonathan Bland-Hawthorn, James Sokolowski, & Gerald Cecil.* 375, 78, 112-A1 (1991)
- Imaging Spectrophotometry of Ionized Gas in NGC 1068. III. Anisotropic Excitation of the Large-Scale Disk by Scattering of Nuclear Continuum. *James Sokolowski, Jonathan Bland-Hawthorn, & Gerald Cecil.* 375, 583, 120-A1 (1991)
- CELOTTI, A. A Model for the Spectral Variability of BL Lacertae Objects at High Frequencies. *A. Celotti, L. Maraschi, & A. Treves.* 377, 403, 144-G1 (1991)
- Short-Term X-Ray Variability of the BL Lacertae Object PKS 2155-304: Power Spectrum and Cross-Correlation Analysis. *G. Tagliaferri, L. Stella, L. Maraschi, A. Treves, & A. Celotti.* 380, 78, 177-A5 (1991)
- CEN, R. Y. A Hydrodynamic Approach to Cosmology: Texture-seeded Cold Dark Matter and Hot Dark Matter Cosmogonies. *R. Y. Cen, J. P. Ostriker, D. N. Spergel, & N. Turok.* 383, 1, 212-B1 (1991)
- CENTRELLA, JOAN. Anisotropies of the Cosmic Background Radiation in a "Hot" Dark Matter Universe. *Peter Anninos, Richard A. Matzner, Robin Tully, & Joan Centrella.* 382, 71, 201-A1 (1991)
- CENTRELLA, JOAN M. The Fragmentation of "Pancakes" in a Dark Matter-dominated Universe. *Wenbo Yuan, Joan M. Centrella, & Michael L. Norman.* 376, L29, 137-A1 (1991)
- CENTURION, MIRIAM. The Local Interstellar Medium toward the Center of Loop I. *Miriam Centurion & Giovanni Vladilo.* 372, 494, 82-A1 (1991)
- CERNICHARO, J. Astronomical Detection of H<sub>2</sub>CCC. *J. Cernicharo, C. A. Gottlieb, M. Guélin, T. C. Killian, G. Paubert, P. Thaddeus, & J. M. Vrtilek.* 368, L39, 35-C7 (1991)
- Astronomical Detection of H<sub>2</sub>CCCC. *J. Cernicharo, C. A. Gottlieb, M. Guélin, T. C. Killian, P. Thaddeus, & J. M. Vrtilek.* 368, L43, 35-C11 (1991)
- CERSOSIMO, J. C. Radio Recombination Lines from Diffuse Interstellar Gas in the Galaxy. *J. C. Cersosimo & J. S. Onello.* 370, 225, 50-A5 (1991)
- CHAFFEE, FREDERIC H. A High Signal-to-Noise Ratio Composite Quasar Spectrum. *Paul J. Francis, Paul C. Hewett, Craig B. Foltz, Frederic H. Chaffee, Ray J. Weymann, & Simon L. Morris.* 373, 465, 93-F10 (1991)
- CHAMBERS, K. C. See WINDHORST, ROGIER A., et al. The Discovery of a Young Radio Galaxy at  $z = 2.390$ : Probing Initial Star Formation at  $z \lesssim 3.0$ .
- See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- CHAMORRO, A. Models of Voids in the Expanding Universe. II. *W. B. Bonnor & A. Chamorro.* 378, 461, 158-B7 (1991)
- Models of Voids in Elliptic Universes. *A. Chamorro.* 383, 51, 212-F1 (1991)
- CHAN, K. L. What Maintains the Zonal Circulation in Planetary Atmospheres? *H. G. Mayr, K. L. Chan, I. Harris, & K. Schatten.* 367, 361, 16-E1 (1991)
- CHAN, K. W. Gamma-Ray Lines from Type I Supernovae. *K. W. Chan & R. E. Lingenfelter.* 368, 515, 31-E1 (1991)
- CHAN, R. Diffusion Processes in the Collapse of a Radiating Spherical Body. *R. Chan, L. Herrera, J. A. F. Pacheco, & N. O. Santos.* 382, 255, 203-D1 (1991)
- CHAN, S. JOSEPHINE. New Candidates for Carbon Stars with Silicate Features. *S. Josephine Chan & Sun Kwok.* 383, 837, 224-F1 (1991)
- CHANG, C. A. Partially Dissociative Jump Shocks in Molecular Hydrogen. *C. A. Chang & P. G. Martin.* 378, 202, 153-E1 (1991)
- CHANG, C. Y. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- CHANG, E. S. Formation of the Infrared Emission Lines of Mg I in the Solar Atmosphere. *E. S. Chang, E. H. Avrett, P. J. Mauas, R. W. Noyes, & R. Loeser.* 379, L79, 175-E1 (1991)
- CHANG, EDWARD S. Electric Field Strengths from the Solar 12 Micron Lines. *Edward S. Chang & William G. Schoenfeld.* 383, 450, 217-G9 (1991)
- CHANMUGAM, G. Formulae for the Cyclotron Luminosity of Magnetized Plasma Slabs. *G. Chanmugam & Steven H. Langer.* 368, 580, 32-C11 (1991)
- The Formation and Detection of Strongly Magnetic White Dwarf Binaries in Globular Clusters. *G. Chanmugam, A. Roy, & K. P. Singh.* 375, 600, 120-B9 (1991)
- CHANTELL, M. See AKERLOF, C. W., et al. Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy.
- CHAPMAN, G. A. Weak Magnetic Fields and Solar Irradiance Variations. *J. K. Lawrence, G. A. Chapman, & S. R. Walton.* 375, 771, 122-C1 (1991)
- CHARBONNEAU, PAUL. Meridional Circulation and Diffusion in A and Early F Stars. *Paul Charbonneau & Georges Michaud.* 370, 693, 57-A10 (1991)
- A Simple Accretion/Diffusion Model for  $\lambda$  Bootis Stars. *Paul Charbonneau.* 372, L33, 79-D13 (1991)
- CHARLOT, STÉPHANE. Stellar Population Synthesis Revisited. *Stéphane Charlot & Gustavo Bruzual.* 367, 126, 13-E5 (1991)
- Attenuation of Lyman-Alpha Emission by Dust in Damped Lyman-Alpha Systems. *Stéphane Charlot & S. Michael Fall.* 378, 471, 158-C7 (1991)
- CHARLTON, JANE C. Galaxy Pairs in Redshift Catalogs as a Probe of Dark Matter. *Jane C. Charlton & Edwin E. Salpeter.* 375, 517, 119-C1 (1991)
- CHARNLAY, S. B. The Formation of Oxygen-containing Organic Molecules in the Orion Compact Ridge. *T. J. Millar, Eric Herbst, & S. B. Charnley.* 369, 147, 37-F11 (1991)
- CHEN, C.-X. Neutrino Oscillations and Solar Models. *C.-X. Chen & M. L. Cherry.* 377, L105, 150-F5 (1991)
- CHEN, JIASHENG. Cosmic-Ray Diurnal Anisotropy, 1936-1988: Implications for Drift and Modulation Theories. *John W. Bieber & Jiasheng Chen.* 372, 301, 77-F4 (1991)
- CHEN, KAIYOU. Polarization Properties of Emission Lines from Relativistic Accretion Disks. *Kaiyou Chen & Douglas M. Eardley.* 382, 125, 201-F10 (1991)
- CHEN, WAN. Nonthermal X-Ray Emission from Winds of OB Supergiants. *Wan Chen & Richard L. White.* 366, 512, 9-D1 (1991)
- Inverse-Compton Gamma-Ray Emission from Chaotic, Early-Type Stellar Winds and Its Detectability by *Gamma Ray Observatory*. *Wan Chen & Richard L. White.* 381, L63, 199-E1 (1991)
- CHENG, CHUNG-CHIEH. Numerical Simulations of Flares on M Dwarf Stars. I. Hydrodynamics and Coronal X-Ray Emission. *Chung-Chieh Cheng & Roberto Pallavicini.* 381, 234, 191-G12 (1991)
- CHENG, E. S. See SMOOT, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.

- See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a 7° Beam by the *Cosmic Background Explorer (COBE)*.
- CHENG, EDWARD S. A Measurement of the Large-Scale Cosmic Microwave Background Anisotropy at 1.8 Millimeter Wavelength. *Stephan S. Meyer, Edward S. Cheng, & Lyman A. Page.* 371, L7, 66-B3 (1991)
- CHENG, F. H. The Shape of the Ultraviolet Continuum of Quasars and Intergalactic Dust. *F. H. Cheng, C. Marin Gaskell, & Anuradha P. Korakar.* 370, 487, 54-D9 (1991)
- CHENG, K. P. The Circumstellar Disks of  $\beta$  Pictoris Analogs. *C. A. Grady, Frederick C. Bruhweiler, K. P. Cheng, W. A. Chiu, & Y. Kondo.* 367, 296, 15-F9 (1991)
- CHENG, K. S. Stationary Accelerators around Keplerian Disks of Aligned Magnetized Collapsed Objects: Pair Production and Gamma-Ray Emission. *K. S. Cheng & M. Ruderman.* 373, 187, 88-C9 (1991)
- Very High Energy Gamma-Ray Emission from Accreting X-Ray Pulsars. *K. S. Cheng, K. N. Yu, T. Cheung, & M. M. Lau.* 379, 290, 166-F1 (1991)
- A Model of Unpulsed Very High Energy Gamma Rays from the Crab Nebula and Pulsar. *P. W. Kwock, K. S. Cheng, & M. M. Lau.* 379, 653, 172-G1 (1991)
- CHENG, KWANG-PING. A Search for Circumstellar Dust around HR 10, a Proposed  $\beta$  Pictoris Star. *Kwang-Ping Cheng, C. A. Grady, & Frederick C. Bruhweiler.* 366, L87, 11-E7 (1991)
- Ultraviolet Fe VII Absorption and Fe II Emission Lines of Central Stars of Planetary Nebulae. *Kwang-Ping Cheng, Walter A. Feibelman, & Frederick C. Bruhweiler.* 377, 235, 140-G7 (1991)
- CHENG, YE. Resonance Excitation of Spiral Density Waves in a Gaseous Disk. II. A Nonlinear Theory and Application to the 3 Kiloparsec Arm. *Chi Yuan & Ye Cheng.* 376, 104, 126-C3 (1991)
- CHERCHNEFF, ISABELLE. Polycyclic Aromatic Hydrocarbon Optical Properties and Contribution to the Acceleration of Stellar Outflows. *Isabelle Cherchneff, John R. Barker, & Alexander G. G. M. Tielens.* 377, 541, 146-D6 (1991)
- CHERNIN, LAWRENCE M. A Nearly Unipolar CO Outflow from the HH 46-47 System. *Lawrence M. Chernin & Colin R. Masson.* 382, L93, 211-E3 (1991)
- CHERNOFF, D. F. Modification of Stellar Populations in Post-Core-Collapse Globular Clusters. *S. Djorgovski, G. Piotto, E. S. Phinney, & D. F. Chernoff.* 372, L41, 79-E11 (1991)
- CHERNOFF, DAVID F. Roseland and Planck Mean Opacities of a Zero-Metallicity Gas. *Paolo Lenzini, David F. Chernoff, & Edwin E. Salpeter.* 76, 759, 35-B13 (1991)
- CHERRY, M. L. Neutrino Oscillations and Solar Models. *C.-X. Chen & M. L. Cherry.* 377, L105, 150-F5 (1991)
- CHEUNG, T. Very High Energy Gamma-Ray Emission from Accreting X-Ray Pulsars. *K. S. Cheng, K. N. Yu, T. Cheung, & M. M. Lau.* 379, 290, 166-F1 (1991)
- CHEVALIER, ROGER A. Steady Spherical Hypercritical Accretion onto Neutron Stars. *John C. Houck & Roger A. Chevalier.* 376, 234, 127-G6 (1991)
- CHEVRETON, M. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- CHIAPPETTI, L. Coordinated X-Ray, Ultraviolet, and Optical Observations of 3C 120. *L. Maraschi, L. Chiappetti, R. Falomo, B. Garilli, M. Malkan, G. Tagliaferri, E. G. Tanzi, & A. Treves.* 368, 138, 24-F9 (1991)
- X-Ray to Infrared Observations of the AM Herculis System E1405-451 (V834 Centauri). *R. M. Sambruna, L. Chiappetti, A. Treves, J. M. Bonnet-Bidaud, P. Bouchet, L. Maraschi, C. Motch, & M. Mouchez.* 374, 744, 108-C10 (1991)
- CHIEFFI, A. The Evolution of He-burning Stars: Horizontal and Asymptotic Branches in Galactic Globulars. *V. Castellani, A. Chieffi, & L. Pulone.* 76, 911, 37-CS (1991)
- CHIEFFI, ALESSANDRO. Isochrones for H-burning Globular Cluster Stars. II. The Metallicity Range  $-2.3 < [\text{Fe}/\text{H}] < -0.5$ . *Oscar Straniero & Alessandro Chieffi.* 76, 525, 32-D1 (1991)
- CHIÈZE, J.-P. The Gas-Phase Chemistry of Organic Molecules in Interstellar Clouds with Dynamical Mixing. *J.-P. Chièze, G. Pineau des Forets, & Eric Herbst.* 373, 110, 87-D4 (1991)
- CHIN, CHAO-WEN. Blue Loops during Core Helium Burning as the Consequence of Moderate Convective Envelope Overshooting in Stars of Intermediate to High Mass. *Richard B. Stothers & Chao-wen Chin.* 374, 288, 101-F3 (1991)
- Evolutionary Sequences of Stellar Models of Intermediate and High Mass Including Convective Core Overshooting. *Chao-wen Chin & Richard B. Stothers.* 77, 299, 48-C1 (1991)
- Metal Opacities and Convective Core Overshooting in Population I Stars. *Richard B. Stothers & Chao-wen Chin.* 381, L67, 199-E7 (1991)
- CHIN, G. A Sensitive Upper Limit on the Methane Abundance in Comet Levy (1990c). *T. Y. Brooke, A. T. Tokunaga, H. A. Weaver, G. Chin, & T. R. Geballe.* 372, L113, 85-G1 (1991)
- CHIN, GORDON. Discovery of a Doppler-limited CO Line in the Upper Mesosphere of Venus: A New Dynamical Probe. *David Buhl, Gordon Chin, & Jeffrey J. Goldstein.* 369, L17, 40-C1 (1991)
- CHINCARINI, GUIDO. A Long-lasting Compact Group. *Fabio Governato, Rajiv Bhatia, & Guido Chincarini.* 371, L15, 66-C1 (1991)
- Scale-invariant Clustering in the Large-Scale Distribution of Galaxies. *Luigi Guzzo, Angela Iovino, Guido Chincarini, Riccardo Giovanelli, & Martha P. Haynes.* 382, L5, 205-B1 (1991)
- CHITRE, S. M. The Resonant Absorption of  $p$ -Modes by Sunspots with Twisted Magnetic Fields. *S. M. Chitre & Joseph M. Davila.* 371, 785, 71-C10 (1991)
- Magnetoacoustic Heating of the Solar Chromosphere. *Joseph M. Davila & S. M. Chitre.* 381, L31, 194-D12 (1991)
- CHIU, W. A. The Circumstellar Disks of  $\beta$  Pictoris Analogs. *C. A. Grady, Frederick C. Bruhweiler, K. P. Cheng, W. A. Chiu, & Y. Kondo.* 367, 296, 15-F9 (1991)
- CHIUEH, TZIHONG. Asymptotic Structure of Hydromagnetically Driven Relativistic Winds. *Tzihong Chiueh, Zhi-yun Li, & Mitchell C. Begelman.* 377, 462, 145-D11 (1991)
- CHLEBOWSKI, TOMASZ. On Winds and X-Rays of O-Type Stars. *Tomasz Chlebowksi & Catharine D. Garmann.* 368, 241, 26-B1 (1991)
- CHOKSHI, ARATI. The Origin of Quasar Correlations. *Neta A. Bahcall & Arati Chokshi.* 380, L9, 181-B11 (1991)
- CHOU, D.-Y. Power Spectra of Solar Convection. *D.-Y. Chou, B. J. LaBonte, D. C. Braun, & T. L. Duvall, Jr.* 372, 314, 77-G5 (1991)
- CHOU, DEAN-YI. The Stretching of Magnetic Flux Tubes in the Convective Overshoot Region. *George H. Fisher, Alexander N. McClymont, & Dean-Yi Chou.* 374, 766, 108-E10 (1991)
- CHRISTENSEN, J. A. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- CHRISTENSEN-DALSGAARD, J. The Response of the Adiabatic Exponent  $\Gamma_1$  to Modifications of Solar Models. *J. Christensen-Dalsgaard & M. J. Thompson.* 367, 666, 21-E4 (1991)
- The Depth of the Solar Convection Zone. *J. Christensen-Dalsgaard, D. O. Gough, & M. J. Thompson.* 378, 413, 156-B4 (1991)
- CHRISTODOULOU, DIMITRIS M. The Stability of Cold, Flattened, Self-gravitating Disks Obeying Other than Newtonian Force Laws. *Dimitris M. Christodoulou.* 372, 471, 81-F1 (1991)
- CHU, YOU-HUA. He II Emission in Extragalactic H II Regions. *Donald R. Garnett, Robert C. Kennicutt, Jr., You-Hua Chu, & Evan D. Skillman.* 373, 458, 93-E14 (1991)
- The Multiple-Shell Structure of the Planetary Nebula NGC 6751. *You-Hua Chu, Arturo Manchado, George H. Jacoby, & Karen B. Kristen.* 376, 150, 126-F13 (1991)
- CHULKOV, I. See BARRET, D., et al. Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2.
- CHURAZOV, E. See BARRET, D., et al. Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2.
- See BOUCHET, L., et al. SIGMA Discovery of Variable  $e^+e^-$  Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7-2942.
- See SUNYAEV, R., et al. Three Spectral States of 1E 1740.7-2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature.

- CHURCH, M. J. The Distribution of Dark Matter in the Perseus Cluster. *C. J. Eyles, M. P. Watt, D. Bertram, M. J. Church, T. J. Ponman, G. K. Skinner, & A. P. Willmore.* 376, 23, 125-C12 (1991)
- CHURCHWELL, ED. Bow Shock Models of Ultracompact H II Regions. *Mordecai-Mark Mac Low, Dave Van Buren, Douglas O. S. Wood, & Ed Churchwell.* 369, 395, 42-F1 (1991)
- The Dynamics and Physical Properties of the Cometary Nebula G29.96-0.02. *Douglas O. S. Wood & Ed Churchwell.* 372, 199, 76-D8 (1991)
- CIAMPA, D. See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- CIARDULLO, ROBIN. Planetary Nebulae as Standard Candles. VII. A Test versus Hubble Type in the NGC 1023 Group. *Robin Ciardullo, George H. Jacoby, & William E. Harris.* 383, 487, 220-D1 (1991)
- CIOFFI, DENIS F. Simulations of the Supernova-dominated Interstellar Medium in Disk Galaxies. *Denis F. Cioffi & J. Michael Shull.* 367, 96, 13-B13 (1991)
- CIOTTI, LUCA. Winds, Outflows, and Inflows in X-Ray Elliptical Galaxies. I. *Luca Ciotti, Annibale D'Ercole, Silvia Pellegrini, & Alvio Renzini.* 376, 380, 131-B12 (1991)
- CLARIÁ, J. J. Detection of the Helium Flash Gap in the Integrated ( $U - B$ ) versus ( $B - V$ ) Diagram for 624 Large Magellanic Cloud Clusters. *E. Bica, J. J. Clariá, H. Dottori, J. F. C. Santos, Jr., & A. Piatti.* 381, L51, 199-C7 (1991)
- CLARK, C. C. Multicolor CCD Imaging of Supergiants in the Disk of NGC 253. *T. J. Davidge, O. Le Fèvre, & C. C. Clark.* 370, 559, 55-D7 (1991)
- CLARK, F. O. The Temperature of Large Dust Grains in Molecular Clouds. *F. O. Clark, R. J. Laureijs, & T. Prusti.* 371, 602, 69-A7 (1991)
- IRAS* Detection of Very Cold Dust in the Lynds 134 Cloud Complex. *R. J. Laureijs, F. O. Clark, & T. Prusti.* 372, 185, 76-C4 (1991)
- CLARK, FRANK O. Young Stellar Objects Detected by *IRAS*. *Frank O. Clark.* 75, 611, 9-B5 (1991)
- Dust and Molecular Properties of the Low-Opacity Cloud Lynds 1563. *Frank O. Clark, R. J. Laureijs, & Lauri L. Wardell.* 370, 237, 50-B7 (1991)
- CLARK, R. E. H. Integral and Differential Cross Sections for Electron Impact Ionization. *R. E. H. Clark, J. Abdallah, Jr., & J. B. Mann.* 381, 597, 198-B9 (1991)
- CLARKE, C. J. The Effect of an External Disk on the Orbital Elements of a Central Binary. *P. Artynowicz, C. J. Clarke, S. H. Lubow, & J. E. Pringle.* 370, L35, 53-E7 (1991)
- The Formation of Primordial Binaries in Globular Clusters by Star-Disk Interactions. *Stephen D. Murray, C. J. Clarke, & J. E. Pringle.* 383, 192, 214-D7 (1991)
- CLARKE, DAVID A. Numerical Simulations of a Restarting Jet. *David A. Clarke & Jack O. Burns.* 369, 308, 41-E4 (1991)
- Atmospheric Gradients and the Stability of Expanding Jets. *Philip E. Hardee, Michael L. Norman, Theodoros Kouvelis, & David A. Clarke.* 373, 8, 86-B10 (1991)
- CLAVEL, J. The Ultraviolet Spectrum of NGC 4151 from 1978 to 1990: General Characteristics and Evolution. *M.-H. Ulrich, A. Boksenberg, G. E. Bromage, J. Clavel, A. Elvius, M. V. Penston, G. C. Perola, & M. A. J. Snijders.* 382, 483, 207-E7 (1991)
- CLAVER, C. F. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- CLAYTON, DONALD D. Bremsstrahlung and Energetic Electrons in Supernovae. *Donald D. Clayton & Lih-Sin The.* 375, 221, 113-F12 (1991)
- CLAYTON, G. C. See TAYLOR, M., et al. First Ultraviolet Spectropolarimetry of Hot Supergiants.
- See BJORKMAN, K. S., et al. First Ultraviolet Spectropolarimetry of Be Stars from the Wisconsin Ultraviolet Photo-Polarimeter Experiment.
- CLEGG, ANDREW W. Variability of Interstellar Hydroxyl Masers. *Andrew W. Clegg & James M. Cordes.* 374, 150, 99-G11 (1991)
- CLEGG, R. E. S. See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- CLEMENS, DAN P. Bok Globules and Small Molecular Clouds: Deep *IRAS* Photometry and  $^{12}\text{CO}$  Spectroscopy. *Dan P. Clemens, João Lin Yun, & Mark H. Heyer.* 75, 877, 13-E1 (1991)
- Polarimetric Mapping of Orion Using MILLIPOL: Magnetic Activity in BN/KL. *Robert W. Leach, Dan P. Clemens, Brian D. Kane, & Richard Bervainis.* 370, 257, 50-D1 (1991)
- Radial Dust Density Profiles in Small Molecular Clouds. *João Lin Yun & Dan P. Clemens.* 381, 474, 196-E7 (1991)
- CLEMENS, J. C. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- CLEMENT, CHRISTINE M. Two Double-Mode RR Lyrae Stars in the Field. *Christine M. Clement, T. D. Kinman, & Nicholas B. Suntzeff.* 372, 273, 77-C13 (1991)
- CLEMENTS, S. D. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- CLIVER, E. High Coronal Flares and Impulsive Acceleration of Solar Energetic Particles. *E. Cliver & S. Kahler.* 366, L91, 11-E11 (1991)
- CLIVER, E. W. A Search for the 154 Day Periodicity in the Occurrence Rate of Solar Flares Using Ottawa 2.8 GHz Burst Data, 1955-1990. *J. N. Kile & E. W. Cliver.* 370, 442, 52-F13 (1991)
- Solar Gamma-Ray-Line Flares, Type II Radio Bursts, and Coronal Mass Ejections. *E. W. Cliver, H. V. Cane, D. J. Forrest, M. J. Koonen, R. A. Howard, & C. S. Wright.* 379, 741, 174-A2 (1991)
- COC, A. On the Sodium Excess in the Atmospheres of Yellow Supergiants. *N. Prantzos, A. Coc, & J. P. Thibaud.* 379, 729, 173-G1 (1991)
- COCHRAN, A. L. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- COCHRAN, ANITA L. New Ultraviolet Spectroscopic Features Found in Comet Brorsen-Metcalf (1989o). *C. R. O'Dell, Christopher O. Miller, Anita L. Cochran, William D. Cochran, Chet B. Opal, & Edwin S. Barker.* 368, 616, 32-G1 (1991)
- COCHRAN, WILLIAM D. New Ultraviolet Spectroscopic Features Found in Comet Brorsen-Metcalf (1989o). *C. R. O'Dell, Christopher O. Miller, Anita L. Cochran, William D. Cochran, Chet B. Opal, & Edwin S. Barker.* 368, 616, 32-G1 (1991)
- Constraints on the Companion Object to HD 114762. *William D. Cochran, Arlie P. Hatzes, & Terry J. Hancock.* 380, L35, 181-E6 (1991)
- Gravitational Instabilities in a Proto-Planetary Disk. *Hyerim Noh, Ethan T. Vishniac, & William D. Cochran.* 383, 372, 217-A1 (1991)
- COCKE, W. J. Statistical Procedure and the Significance of Periodicities in Double-Galaxy Redshifts. *W. J. Cocke & W. G. Tiff.* 368, 383, 29-G6 (1991)
- R Aquarii: H $\alpha$  Map of Subarcsecond Inner Structure. *E. K. Hege, C. K. Allen, & W. J. Cocke.* 381, 543, 197-D6 (1991)
- CODE, A. D. See TAYLOR, M., et al. First Ultraviolet Spectropolarimetry of Hot Supergiants.
- See BJORKMAN, K. S., et al. First Ultraviolet Spectropolarimetry of Be Stars from the Wisconsin Ultraviolet Photo-Polarimeter Experiment.
- CODE, ARTHUR. See HOLTZMAN, JON A., et al. Stellar Photometry with the *Hubble Space Telescope* Wide-Field/Planetary Camera: A Progress Report.
- See HESTER, J. JEFF, et al. Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0''.1.
- COHEN, J. G. Abundances in the Red Giants of M13 and M22. *M. D. Lehnert, R. A. Bell, & J. G. Cohen.* 367, 514, 19-F9 (1991)
- COHEN, MARTIN. HH 5, HH 6, and Their Exciting Stars. *Martin Cohen, Burton F. Jones, & Mark Hereld.* 371, 237, 63-B1 (1991)
- IRAS 17380-3031: A New Dusty Late WC-Type Wolf-Rayet Star. *Martin Cohen, K. A. van der Hucht, P. M. Williams, & P. S. Thé.* 378, 302, 154-F7 (1991)

- COHEN, R. D. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- COHEN, ROSS D. See BEAVER, E. A., et al. Far-Ultraviolet Spectroscopy of the Quasar UM 675 with the Faint Object Spectrograph on the *Hubble Space Telescope*.
- The 0.46–1.3 Micron Spectrum of the Planetary Nebula BD +30°3639. *Richard J. Rudy, Ross D. Cohen, George S. Rossano, Peter Erwin, R. C. Puettner, & David K. Lynch.* 380, 151, 178-A1 (1991)
- COHN, HALDAN. Fokker-Planck Calculations of Star Clusters with Primordial Binaries. *Bin Gao, Jeremy Goodman, Haldan Cohn, & Brian Murphy.* 370, 567, 55-E1 (1991)
- COHN, HALDAN N. Dynamical and Luminosity Evolution of Active Galactic Nuclei: Models with a Mass Spectrum. *Brian W. Murphy, Haldan N. Cohn, & Richard H. Durisen.* 370, 60, 47-G1 (1991)
- COLAFRANCESCO, S. The Merging Runaway. *A. Cavaliere, S. Colafrancesco, & N. Menci.* 376, L37, 137-B10 (1991)
- The Mass Distribution of Groups and Clusters of Galaxies. *A. Cavaliere, S. Colafrancesco, & R. Scaramella.* 380, 15, 176-C1 (1991)
- COLANGELI, LUIGI. Hydrogenated Amorphous Carbon Grains and the 2175 Å Interstellar Hump. *Armando Blanco, Ezio Bussolati, Luigi Colangeli, Sergio Fonti, & John R. Stephens.* 382, L97, 211-E8 (1991)
- COLE, S. Excursion Set Mass Functions for Hierarchical Gaussian Fluctuations. *J. R. Bond, S. Cole, G. Efstathiou, & N. Kaiser.* 379, 440, 170-C1 (1991)
- COLE, SHAUN. Modeling Galaxy Formation in Evolving Dark Matter Halos. *Shaun Cole.* 367, 45, 12-E7 (1991)
- COLGAN, SEAN W. J. Far-Infrared Line and Continuum Observations of G0.095+0.012 and the E2 Thermal Radio Filament near the Galactic Center. *Edwin F. Erickson, Sean W. J. Colgan, J. P. Simpson, Robert H. Rubin, Mark Morris, & Michael R. Haas.* 370, L69, 59-C1 (1991)
- COLINA, L. IC 5063: A Merger Remnant with a Hidden Luminous Active Nucleus. *L. Colina, W. B. Sparks, & F. Macchetto.* 370, 102, 48-C5 (1991)
- COLINA, LUIS. Massive Star Formation and Superwinds in IRAS 19254–7245 (The “Superantennae”). *Luis Colina, Sebastian Lipari, & F. Macchetto.* 379, 113, 164-D5 (1991)
- IRAS 02366–3101: An Accretion Disk Candidate among Luminous IRAS Galaxies. *Luis Colina, Sebastian Lipari, & F. Macchetto.* 382, L63, 211-B7 (1991)
- COLLINS, GEORGE W. II. Constraints on the Physical Properties of Optical Bullets in SS 433. *John C. Brown, Joseph P. Cassinelli, & George W. Collins II.* 378, 307, 154-G1 (1991)
- Model Atmospheres for Rotating B Stars. *George W. Collins II, Ryland J. Truax, & Steven R. Cranmer.* 77, 541, 52-B5 (1991)
- COLLISON, ALAN J. Axisymmetric Models of Circumstellar Dust Shells. *Alan J. Collison & John D. Fix.* 368, 545, 31-G7 (1991)
- COLOMBO, E. See VACANTI, G., et al. Gamma-Ray Observations of the Crab Nebula at TeV Energies.
- COLPI, MONICA. Explosion of a Rotating Neutron Star near the Minimum Mass. *Monica Colpi, Stuart L. Shapiro, & Saul A. Teukolsky.* 369, 422, 43-A5 (1991)
- COMBES, F. Detection of Interstellar  $H_3O^+$ : A Confirming Line. *Alwyn Wootton, J. G. Mangum, B. E. Turner, M. Bogey, F. Boulanger, F. Combes, P. J. Encrenaz, & M. Gerin.* 380, L79, 188-E6 (1991)
- COMBI, MICHAEL R. Comet P/Halley: Spatial Distributions and Scale Lengths for  $C_2$ , CN,  $NH_2$ , and  $H_2O$ . *Uwe Fink, Michael R. Combi, & Michael A. DiSanti.* 383, 356, 216-F9 (1991)
- COMINS, NEIL F. The Extraordinary Radio Source 3C 442. *Neil F. Comins & Frazer N. Owen.* 382, 108, 201-E1 (1991)
- COMINSKY, L. R. Multimission Observations of 4U 1538–52. *L. R. Cominsky & F. Moraes.* 370, 670, 56-F10 (1991)
- COMTE, R. See MASSARO, E., et al. Detection of a Feature at 0.44 MeV in the Crab Pulsar Spectrum with FIGARO II: A Redshifted Positron Annihilation Line?
- CONDON, J. J. The 87GB Catalog of Radio Sources Covering  $0^\circ < \delta < +75^\circ$  at 4.85 GHz. *P. C. Gregory & J. J. Condon.* 75, 1011, 17-A1 (1991)
- Correlations between Far-Infrared, Radio, and Blue Luminosities of Spiral Galaxies. *J. J. Condon, M. L. Anderson, & G. Helou.* 376, 95, 126-B7 (1991)
- Compact Starbursts in Ultraluminous Infrared Galaxies. *J. J. Condon, Z.-P. Huang, Q. F. Yin, & T. X. Thuan.* 378, 65, 151-G5 (1991)
- CONLON, E. S. *IUE* Observations of Early-Type Stars at High Galactic Latitudes. *D. A. Quin, P. J. F. Brown, E. S. Conlon, P. L. Dufton, & P. Keenan.* 375, 342, 115-B7 (1991)
- The  $3s^2 3p\ 2P - 3s3p\ 2^4P$  Intercombination Lines of Fe XIV in the Sun. *F. P. Keenan, P. L. Dufton, E. S. Conlon, M. B. Boylan, A. E. Kingston, & K. G. Widing.* 379, 406, 168-A11 (1991)
- Improved Line Ratio Calculations Involving  $\Delta n = 1$  (2–3) Transitions in O V and a Reanalysis of *Skylab* Observations of Solar Flares. *F. P. Keenan, P. L. Dufton, L. K. Harra, E. S. Conlon, K. A. Berrington, & K. G. Widing.* 382, 349, 204-E1 (1991)
- CONNER, SAM. The Fourth MIT-Green Bank 5 GHz Survey. *Mark Griffith, Gil Langston, Mike Heflin, Sam Conner, & Bernard Burke.* 75, 801, 12-C5 (1991)
- CONNOLY, A. J. The Effect of Inclination-dependent Selection on *IRAS* Galaxy Detection Rates. *A. J. Connolly, R. D. Joseph, & P. A. James.* 370, 140, 48-G6 (1991)
- CONTI, PETER S. DD 13: A Very Young and Heavily Reddened Early O Star in the Large Magellanic Cloud. *Peter S. Conti & Edward L. Fitzpatrick.* 373, 100, 87-C5 (1991)
- Wolf-Rayet Galaxies: An Introduction and a Catalog. *Peter S. Conti.* 377, 115, 139-D7 (1991)
- CONTINI, MARCELLA. The Bumps in the Spectral Energy Distribution of Active Galactic Nuclei. *Marcella Contini & Sueli M. Viegas.* 373, 405, 93-A9 (1991)
- CONTOPoulos, J. Magnetically Driven Jets and Winds. *R. V. E. Lovelace, H. L. Berk, & J. Contopoulos.* 379, 696, 173-D1 (1991)
- COOK, J. W. Evidence for a 250 Second Brightness Oscillation at 1600 Å in the Solar Temperature Minimum Region. *J. W. Cook & J. A. Ewing.* 371, 804, 71-E5 (1991)
- COOK, KEM H. See GRIEST, KIM, et al. Gravitational Microlensing as a Method of Detecting Disk Dark Matter and Faint Disk Stars.
- COOK, WALTER R. Coded-Aperture Imaging of the Galactic Center Region at Gamma-Ray Energies. *Walter R. Cook, John M. Grunsfeld, William A. Heindl, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone.* 372, L75, 85-D1 (1991)
- COOPER, R. See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- COPPI, PAOLO S. Variable Soft X-Ray Excesses in Active Galactic Nuclei from Nonthermal Electron-Positron Pair Cascades. *Andrzej A. Zdziarski & Paolo S. Coppi.* 376, 480, 132-D5 (1991)
- CORBATO, S. C. See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- CORBELLI, EDVIGE. The Joint Far-Infrared–Optical Luminosity Function for Spiral Galaxies and Data for the Abell 400 and Cancer Clusters. *Edvige Corbelli, Edwin E. Salpeter, & John M. Dickey.* 370, 49, 47-F4 (1991)
- CORBET, R. LMC X-4: Ginga Observations and Search for Orbital Period Changes. *A. Levine, S. Rappaport, A. Putney, R. Corbet, & F. Nagase.* 381, 101, 190-C7 (1991)
- CORBET, R. H. D. A New Candidate Orbital Period for KO Velorum (E1013–477). *K. Mukai & R. H. D. Corbet.* 378, 701, 161-B3 (1991)
- CORBET, ROBIN H. D. A Study of the H $\alpha$  Line in X1735–444. *Alan P. Smale & Robin H. D. Corbet.* 383, 853, 224-G6 (1991)
- CORBIN, MICHAEL R. A Comparison of C IV and H $\beta$  Broad Emission-Line Profiles in Low-Redshift Active Galactic Nuclei. *Michael R. Corbin.* 371, L51, 73-B1 (1991)
- Physical Conditions in the Orion Nebula and an Assessment of Its Helium Abundance. *Jack A. Baldwin, Gary J. Ferland, P. G. Martin, Michael R. Corbin, Stephen A. Cota, Bradley M. Peterson, & Arne Slettebak.* 374, 580, 106-D1 (1991)
- The Emission-Line Properties of Steep Radio Spectrum Quasars. *Michael R. Corbin.* 375, 503, 119-A11 (1991)
- CORDES, J. M. A Relativistic Model of Pulsar Polarization. *M. Blaskiewicz, J. M. Cordes, & I. Wasserman.* 370, 643, 56-D9 (1991)

- VLA and VLBI Angular Broadening Measurements: The Distribution of Interstellar Scattering at Low Galactic Latitudes.** *A. L. Fey, S. R. Spangler, & J. M. Cordes.* 372, 132, 75-F1 (1991)
- Discovery of a Young, 267 Millisecond Pulsar in the Supernova Remnant W44.** *A. Wolszczan, J. M. Cordes, & R. J. Dewey.* 372, L99, 85-F1 (1991)
- H I Absorption Measurements toward 15 Pulsars and the Radial Distribution of Diffuse Ionized Gas in the Galaxy.** *D. A. Frail, J. M. Cordes, T. H. Hankins, & J. M. Weisberg.* 382, 168, 202-C10 (1991)
- CORDES, JAMES M.** Variability of Interstellar Hydroxyl Masers. *Andrew W. Clegg & James M. Cordes.* 374, 150, 99-G11 (1991)
- Interstellar Scattering Effects on the Detection of Narrow-Band Signals.** *James M. Cordes & T. Joseph Lazio.* 376, 123, 126-D10 (1991)
- CORDIER, B.** See BOUCHET, L., et al. SIGMA Discovery of Variable  $e^+e^-$  Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7-2942.
- See SUNYAEV, R., et al. Three Spectral States of 1E 1740.7-2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature.
- CÓRDOVA, F. A.** The Proper Motion of the Soft X-Ray-emitting Radio Pulsar PSR 0656+14. *R. J. Thompson, Jr., F. A. Córdova, R. M. Hellings, & E. B. Fomalont.* 366, L83, 11-E1 (1991)
- CORNELL, ROBERT H.** See BOHLIN, RALPH C., et al. Simulated Optical Images of Galaxies at  $z \sim 1$  Using Ultraviolet Images of Nearby Galaxies.
- CORNWELL, TIMOTHY J.** A Search for Redshifted Neutral Hydrogen from Protoclusters of Galaxies. *Juan M. Uson, Durgadas S. Bagri, & Timothy J. Cornwell.* 377, L65, 150-B1 (1991)
- CORTÉS, G.** Two Planetary Nebulae in the Direction of the Galactic Center. *A. Gutiérrez-Moreno, H. Moreno, & G. Cortés.* 383, 174, 214-C1 (1991)
- COSTA, A.** Analysis of Radiation Pressure Effects in Pulsating Stars through Perturbative Limit Cycle Solutions. *A. Costa, D. Gómez, & C. Ferro Fontán.* 373, 237, 88-G13 (1991)
- COSTA, E.** See MASSARO, E., et al. Detection of a Feature at 0.44 MeV in the Crab Pulsar Spectrum with FIGARO II: A Redshifted Positron Annihilation Line?
- X-Ray Observations of the Seyfert 1 Galaxy Markarian 464. *L. Piro, G. Matz, E. Costa, D. Dal Fiume, F. Frontera, & E. Morelli.* 380, 357, 182-F9 (1991)
- COSTAIN, C. H.** An X-Ray and Radio Study of Steep-Spectrum Radio Sources. II. Four Fields from a 22 MHz Polar Cap Survey. *P. E. Dewdney, C. H. Costain, I. McHardy, A. G. Willis, D. E. Harris, & C. P. Stern.* 76, 1055, 40-D1 (1991)
- COTA, STEPHEN A.** Physical Conditions in the Orion Nebula and an Assessment of its Helium Abundance. *Jack A. Baldwin, Gary J. Ferland, P. G. Martin, Michael R. Corbin, Stephen A. Cota, Bradley M. Peterson, & Arne Slettebak.* 374, 580, 106-D1 (1991)
- CÔTÉ, STÉPHANIE.** The H I Content of the Local Group Dwarf (Spherical or Irregular?) Galaxy Phoenix. *Claude Carignan, Serge Demers, & Stéphanie Côté.* 381, L13, 194-C1 (1991)
- COUCHMAN, H. M. P.** Mesh-refined P<sup>3</sup>M: A Fast Adaptive N-Body Algorithm. *H. M. P. Couchman.* 368, L23, 35-A11 (1991)
- COURT, A.** See UBERTINI, P., et al. "Superlow-State" Hard X-Ray Observation of Cygnus X-1.
- COURT, A. J.** See BAZZANO, A., et al. Hard X-Rays from Coma Cluster Region: Erratum.
- See PEROTTI, F., et al. Hard X-Ray Variability of NGC 4151.
- COUTURE, JEAN.** Multicolor CCD Photometry of Globular Clusters in Two Virgo Elliptical Galaxies. *Jean Couture, William E. Harris, & J. W. B. Allbright.* 372, 97, 75-C1 (1991)
- COWAN, JOHN J.** The Radio Recovery of SN 1970G in M101. *John J. Cowan, W. M. Goss, & R. A. Sramek.* 379, L49, 175-B5 (1991)
- COWIE, L. L.** A Deep Imaging and Spectroscopic Survey of Faint Galaxies. *S. J. Lilly, L. L. Cowie, & J. P. Gardner.* 369, 79, 37-A1 (1991)
- COWIE, LENNOX L.** Lyman- $\alpha$  Companions to High-z Quasars. *Esther M. Hu, Antoinette Songaila, Lennox L. Cowie, & Alan Stockton.* 368, 28, 23-D9 (1991)
- COWLEY, A. P.** The Halo of the Large Magellanic Cloud: Kinematics of the CH Stars. *A. P. Cowley & F. D. A. Hartwick.* 373, 80, 87-A8 (1991)
- The Near-Infrared Spectra of Low-Mass X-Ray Binaries and Related Objects.** *A. P. Cowley, P. C. Schmidke, D. Crampton, J. B. Hutchings, & M. Bolte.* 373, 228, 88-G1 (1991)
- Discovery of a Long-Term Periodic Variation in LMC X-3.** *A. P. Cowley, P. C. Schmidke, K. Ebisawa, F. Makino, R. A. Remillard, D. Crampton, J. B. Hutchings, S. Kitamoto, & A. Treves.* 381, 526, 197-C1 (1991)
- COWLEY, CHARLES R.** Metallic Line Profiles of the A0 V Star Vega. *Austin F. Gulliver, Saul J. Adelman, Charles R. Cowley, & J. Murray Fletcher.* 380, 223, 178-G1 (1991)
- COX, ARTHUR N.** The RRD Masses Revisited. *Norman R. Simon & Arthur N. Cox.* 376, 717, 135-C1 (1991)
- Effects of Opacity and Equation of State on Solar Structure and Oscillations.** *Joyce A. Guzik & Arthur N. Cox.* 381, 333, 193-B5 (1991)
- Masses of RRD Variables Using Livermore OPAL Opacities.** *Arthur N. Cox.* 381, L71, 199-F1 (1991)
- Post-Asymptotic Giant Branch Nonradial Instability Strips.** *Letizia Stanghellini, Arthur N. Cox, & Sumner Starrfield.* 383, 766, 223-F10 (1991)
- CRAGG, DINAH M.** Pumping the Interstellar (6,3) Ammonia Maser. *Ronald D. Brown & Dinah M. Cragg.* 378, 445, 156-D10 (1991)
- CRAIG, I. J. D.** Nonlinear Development of the Kink Instability in Coronal Flux Tubes: Erratum. *I. J. D. Craig & A. D. Sneyd.* 371, 443, 65-F3 (1991) (Orig. paper in 357, 653, 120-F5 (1990))
- Dynamic Magnetic Reconnection at an X-Type Neutral Point.** *I. J. D. Craig & A. N. McClymont.* 371, L41, 66-F1 (1991)
- CRAIG, N.** Further High-Resolution Na I Observations of the Local Interstellar Medium. *B. Y. Welsh, P. W. Vedder, J. V. Vallerga, & N. Craig.* 381, 462, 196-D7 (1991)
- CRAIG, NAHIDE.** Probing Shock Models of CH<sup>+</sup> Formation. *Isabel Hawkins & Nahide Craig.* 375, 642, 120-F1 (1991)
- CRAMPTON, D.** See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- The Near-Infrared Spectra of Low-Mass X-Ray Binaries and Related Objects.** *A. P. Cowley, P. C. Schmidke, D. Crampton, J. B. Hutchings, & M. Bolte.* 373, 228, 88-G1 (1991)
- See COWLEY, A. P., et al. Discovery of a Long-Term Periodic Variation in LMC X-3.
- CRANE, P.** See MACCHETTO, F., et al. First Results from the Faint Object Camera: Observations of PKS 0521-36.
- First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305. *P. Crane, R. Albrecht, C. Barbieri, J. C. Blades, A. Bokensberg, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kamperman, I. R. King, F. Macchetto, C. D. Mackay, F. Paresce, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, & W. B. Sparks.* 369, L59, 46-A7 (1991)
- See JAKOBSEN, P., et al. First Results from the Faint Object Camera: SN 1987A.
- See PARESCHE, F., et al. First Results from the Faint Object Camera: Imaging the Core of R Aquarii.
- See MACCHETTO, F., et al. HST Observations of 3C 66B: A Double-stranded Optical Jet.
- See ALBRECHT, R., et al. First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System.
- See WEIGELT, G., et al. First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.
- CRANE, PHILIPPE.** Interstellar <sup>12</sup>C/<sup>13</sup>C Ratio Revisited. *Philippe Crane, Dennis J. Hegyi, & David L. Lambert.* 378, 181, 153-C1 (1991)
- The Scale Dependence of Galaxy Distribution Functions. *William C. Saslaw & Philippe Crane.* 380, 315, 182-C1 (1991)
- CRANMER, STEVEN R.** Model Atmospheres for Rotating B Stars. *George W. Collins II, Ryland J. Truax, & Steven R. Cranmer.* 77, 541, 52-B5 (1991)
- CRAWFORD, DAVID F.** A New Gravitational Interaction of Cosmological Importance. *David F. Crawford.* 377, 1, 138-B1 (1991)
- CRIFO, J. F.** The Formation and Role of Water Dimers in a Cometary Atmosphere, with Application to Comet P/Halley. *J. F. Crifo & Z. Slanina.* 383, 351, 216-F1 (1991)

- CRISTIANI, S. 3C 345: Is the Variability of Quasars Nonlinear? *R. Vio, S. Cristiani, O. Lessi, & L. Salvadori.* 380, 351, 182-F1 (1991)
- CRIVELLARI, L. The Use of Iteration Factors for Temperature Correction in a Stellar Atmosphere When Convective Transport Is Present. *L. Crivellari & E. Simonneau.* 367, 612, 20-G10 (1991)
- CROTS, ARLIN P. S. Using SN 1987A Light Echoes to Determine Mass Loss from the Progenitor. *Arlin P. S. Croots & William E. Kunkel.* 366, L73, 11-D1 (1991)
- CRUSIUS-WÄTZEL, ANDRÉ R. Saturation of the Synchrotron Megamaser. *André R. Crusius-Wätzels.* 368, 390, 30-A1 (1991)
- CUDDEFORD, PHIL. Extended Stellar Hydrodynamics for Galactic Disks. *Peter Amend & Phil Cuddeford.* 368, 79, 24-B1 (1991)
- Extended Stellar Hydrodynamics for Galactic Disks: Erratum. *Peter Amend & Phil Cuddeford.* 375, 427, 116-B12 (1991) (Orig. paper in 368, 79, 24-B1 (1991))
- ČUK, M. Regularities of Stark Parameters along the Periodic Table. *J. Puric, M. Čuk, M. S. Dimitrijević, & A. Lesage.* 382, 353, 204-E7 (1991)
- CURIR, A. Massive Black Holes in the Nuclei of Spiral Galaxies: M31 and the Problem of the Initial Conditions. *M. Bradley, A. Curir, & F. de Felice.* 381, 72, 189-G11 (1991)
- CURRIE, DOUGLAS G. See LYNDS, ROGER, et al. NGC 1068: Resolution of Nuclear Structure in the Optical Continuum.
- See HOLTZMAN, JON A., et al. Stellar Photometry with the *Hubble Space Telescope* Wide-Field/Planetary Camera: A Progress Report.
- See LAUER, TOD R., et al. The Core of the Nearby S0 Galaxy NGC 7457 Imaged with the *HST* Planetary Camera.
- See LAUER, TOD R., et al. The Postcollapse Core of M15 Imaged with the *HST* Planetary Camera.
- See WESTPHAL, JAMES A., et al. *Hubble Space Telescope* Wide-Field/Planetary Camera Images of Saturn.
- See HESTER, J. JEFF, et al. Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0".1.
- CUTLER, CURT. Post-Newtonian Effects on the Modes of Rotating Stars. *Curt Cutler.* 374, 248, 101-C1 (1991)
- CUTLER, D. J. Mayflower Mine 1500 GV Detector: Cosmic-Ray Anisotropy and Search for Cygnus X-3. *D. J. Cutler & D. E. Groom.* 376, 322, 128-G12 (1991)
- CUTRI, ROC M. An Infrared/Optical Investigation of 100 Micron "Cirrus." *Elizabeth S. Paley, Frank J. Low, John T. McGraw, Roc M. Cutri, & Hans-Walter Rix.* 376, 335, 129-A13 (1991)
- DA COSTA, L. N. Surface Photometry of a Sample of Elliptical and S0 Galaxies. *R. R. de Carvalho, S. Djorgovski, & L. N. da Costa.* 76, 1067, 40-E1 (1991)
- DA COSTA, L. NICOLACI. Southern Sky Redshift Survey: The Catalog. *L. Nicolaci da Costa, Paulo S. Pellegrini, Marc Davis, Avery Meiksin, Wallace L. W. Sargent, & John L. Tonry.* 75, 935, 15-B1 (1991)
- DADYKIN, V. L. See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- DAHLBURG, R. B. Dynamics of Solar Coronal Magnetic Fields. *R. B. Dahlburg, S. K. Antiochos, & T. A. Zang.* 383, 420, 217-E1 (1991)
- D'ALESSIO, PAOLA. Irradiation of Accretion Disks around Young Objects. I. Near-Infrared CO Bands. *Nuria Calvet, Alberto Patiño, Gladis Magis C., & Paola D'Alessio.* 380, 617, 185-G8 (1991)
- DAL FIUME, D. X-Ray Observations of the Seyfert 1 Galaxy Markarian 464. *L. Piro, G. Matt, E. Costa, D. Dal Fiume, F. Frontera, & E. Morelli.* 380, 357, 182-F9 (1991)
- DALGARNO, A. Near-Infrared Emission of Neutral Carbon from Photon-dominated Regions. *V. Escalante, A. Sternberg, & A. Dalgarno.* 375, 630, 120-E1 (1991)
- Interstellar Photodissociation and Photoionization Rates. *W. G. Robarge, D. Jones, S. Lepp, & A. Dalgarno.* 77, 287, 48-B1 (1991)
- DALGARNO, ALEXANDER. Nitrogen Recombination Lines and Abundance in Nova Shells. *Vladimir Escalante & Alexander Dalgarno.* 369, 213, 38-E7 (1991)
- DALLE ORE, CRISTINA. Galaxy Velocity Dispersions Using a Cross-Correlation Method: Erratum. *Cristina Dalle Ore, S. M. Faber, J. Jesús Gonzalez, Roland Stoughton, & David Burstein.* 375, 427, 116-B12 (1991) (Orig. paper in 366, 38, 1-E5 (1991))
- DALL'OGLIO, G. Diffuse Galactic Emission at Millimetric Wavelengths. *P. Andreani, G. Dall'Oglie, L. Martinis, L. Piccirillo, L. Pizza, L. Rossi, & C. Venturino.* 375, 148, 112-G5 (1991)
- DALY, R. A. Spectral Distortions of the Microwave Background Radiation Resulting from the Damping of Pressure Waves. *R. A. Daly.* 371, 14, 60-C3 (1991)
- Constraints on Models for the High- and Low-Energy X-Ray Backgrounds. *R. A. Daly.* 379, 37, 163-E1 (1991)
- DAME, T. M. Galactic Structure from the *Spacelab* Infrared Telescope. II. Luminosity Models of the Milky Way. *S. M. Kent, T. M. Dame, & G. Fazio.* 378, 131, 152-F1 (1991)
- A Complete CO Survey of M31. *E. Koper, T. M. Dame, F. P. Israel, & P. Thaddeus.* 383, L11, 219-B7 (1991)
- D'AMICO, N. X-Ray and Radio Pulse Phase Comparison for PSR 1509-58. *N. Kawai, R. Okazaki, W. Brinkmann, R. Manchester, A. G. Lyne, & N. D'Amico.* 383, L65, 226-D12 (1991)
- DAMOUR, THIBAULT. On the Orbital Period Change of the Binary Pulsar PSR 1913+16. *Thibault Damour & J. H. Taylor.* 366, 501, 9-C1 (1991)
- DANCHI, W. C. Distribution of Dust about  $\alpha$  Ceti and  $\alpha$  Orionis Based on 11 Micron Spatial Interferometry. *M. Bester, W. C. Danchi, C. G. Degiacomi, C. H. Townes, & T. R. Geballe.* 367, L27, 17-E1 (1991)
- Molecular Line Survey of Sagittarius B2(M) from 330 to 355 GHz and Comparison with Sagittarius B2(N). *E. C. Sutton, P. A. Jaminet, W. C. Danchi, & Geoffrey A. Blake.* 77, 255, 47-F1 (1991)
- CO  $J = 3-2$  and  $J = 2-1$  Observations of NGC 7027. *P. A. Jaminet, W. C. Danchi, E. C. Sutton, A. P. G. Russell, Göran Sandell, J. H. Biegling, & D. Wilner.* 380, 461, 184-A4 (1991)
- DANEN, R. M. The Galactic Center Radio Source Shines below the Compton Limit. *C. R. Gwinn, R. M. Danen, J. Middleditch, L. M. Ozernoy, & T. Kh. Tran.* 381, L43, 199-B7 (1991)
- DANESE, L. Constraints on the Thermal History of the Universe from the Cosmic Microwave Background Spectrum. *C. Burigana, G. De Zotti, & L. Danese.* 379, 1, 163-B1 (1991)
- Small-Scale Fluctuations and Angular Correlations of the X-Ray Background in the HEAO 1 A-2 Energy Band: Constraints on Clustering of X-Ray Sources. *J. M. Martin-Morales, G. De Zotti, E. A. Boldi, F. E. Marshall, L. Danese, A. Franceschini, & M. Persic.* 379, 507, 171-A4 (1991)
- DANIELSON, G. EDWARD. See WESTPHAL, JAMES A., et al. *Hubble Space Telescope* Wide-Field/Planetary Camera Images of Saturn.
- See HESTER, J. JEFF, et al. Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0".1.
- DANZIGER, JOHN. Testing the Gravitational Field in Elliptical Galaxies: NGC 5077. *Francesco Bertola, Daniela Bettini, John Danziger, Elaine Sadler, Linda Sparke, & Tim de Zeeuw.* 373, 369, 92-E10 (1991)
- DAPERGOLAS, A. Observations of the Peculiar Object MWC 560 in Outburst. *A. G. Michalitsianos, S. P. Maran, R. J. Oliver, B. Bopp, E. Kontizas, A. Dapergolas, & M. Kontizas.* 371, 761, 71-A7 (1991)
- DAR, ARNON. Are Quasar Redshifts Cosmological? *Arnon Dar.* 382, L1, 205-A7 (1991)
- DAUGHERTY, JOSEPH K. Cyclotron Resonant Scattering and Absorption. *Alice K. Harding & Joseph K. Daugherty.* 374, 687, 107-E8 (1991)
- DAVID, L. P. Evolution of the Interstellar Medium in Elliptical Galaxies. II. X-Ray Properties. *L. P. David, W. Forman, & C. Jones.* 369, 121, 37-D9 (1991)
- Enrichment and Heating of the Intracluster Medium through Galactic Winds. *L. P. David, W. Forman, & C. Jones.* 380, 39, 176-E1 (1991)
- DAVIDGE, T. J. Multicolor CCD Imaging of Supergiants in the Disk of NGC 253. *T. J. Davidge, O. Le Fevre, & C. C. Clark.* 370, 559, 55-D7 (1991)
- JHK Imaging of a Field in Baade's Window. *T. J. Davidge.* 380, 116, 177-E1 (1991)
- DAVIDSEN, A. F. See BEAVER, E. A., et al. Far-Ultraviolet Spectroscopy of the Quasar UM 675 with the Faint Object Spectrograph on the *Hubble Space Telescope*.

- See FELDMAN, P. D., et al. Observations of Comet Levy (1990c) with the Hopkins Ultraviolet Telescope.
- See MOOS, H. W., et al. Determination of Ionic Abundances in the Io Torus Using the Hopkins Ultraviolet Telescope.
- DAVIDSEN, ARTHUR F. See BLAIR, WILLIAM P., et al. Discovery of a Fast Radiative Shock Wave in the Cygnus Loop Using the Hopkins Ultraviolet Telescope.
- See LONG, KNOX S., et al. Spectroscopy of Z Camelopardalis in Outburst with the Hopkins Ultraviolet Telescope.
- See FERGUSON, HENRY C., et al. Constraints on the Origin of the Ultraviolet Upturn in Elliptical Galaxies from Hopkins Ultraviolet Telescope Observations of NGC 1399.
- DAVIDSON, J. A. Far-Infrared and Submillimeter Wavelength Observations of Star-forming Dense Cores. II. Images. *E. F. Ladd, Fred C. Adams, S. Casey, J. A. Davidson, G. A. Fuller, D. A. Harper, P. C. Myers, & R. Padman*. 382, 555, 208-D7 (1991)
- DAVIES, M. B. Stellar Encounters Involving Red Giants in Globular Cluster Cores. *M. B. Davies, W. Benz, & J. G. Hills*. 381, 449, 196-C7 (1991)
- DAVILA, JOSEPH M. The Resonant Absorption of *p*-Modes by Sunspots with Twisted Magnetic Fields. *S. M. Chitre & Joseph M. Davila*. 371, 785, 71-C10 (1991)
- Magnetoacoustic Heating of the Solar Chromosphere. *Joseph M. Davila & S. M. Chitre*. 381, L31, 194-D12 (1991)
- DAVIS, L. E. OH Emission and the Nature of Minkowski's Footprint (M1-92). *E. R. Sequist, René Plume, & L. E. Davis*. 367, 200, 14-E5 (1991)
- DAVIS, MARC. Southern Sky Redshift Survey: The Catalog. *L. Nicolaci da Costa, Paulo S. Pellegrini, Marc Davis, Avery Meiksin, Wallace L. W. Sargent, & John L. Tonry*. 75, 935, 15-B1 (1991)
- A Redshift Survey of IRAS Galaxies. II. Methods for Determining Self-consistent Velocity and Density Fields. *Amos Yahil, Michael A. Strauss, Marc Davis, & John P. Huchra*. 372, 380, 80-E5 (1991)
- A Redshift Survey of IRAS Galaxies. III. Reconstruction of the Velocity and Density Fields in N-Body Model Universes. *Marc Davis, Michael A. Strauss, & Amos Yahil*. 372, 394, 80-F7 (1991)
- A Redshift Survey of IRAS Galaxies. II. Methods for Determining Self-consistent Velocity and Density Fields: Erratum. *Amos Yahil, Michael A. Strauss, Marc Davis, & John P. Huchra*. 381, 348, 193-C10 (1991) (Orig. paper in 372, 380, 80-E5 (1991))
- Nonlinear Matter Clustering Properties of a Cold Dark Matter Universe. *François R. Bouchet, Richard Schaeffer, & Marc Davis*. 383, 19, 212-C7 (1991)
- DAWSON, B. R. See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- DE AMICI, G. See SMOOT, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- DE AMICI, GIOVANNI. The Temperature of the Cosmic Microwave Background Radiation at 3.8 GHz: Results of a Measurement from the South Pole Site. *Giovanni De Amici, Marco Bersanelli, Al Kotug, Steve Levin, Michele Limon, & George F. Smoot*. 381, 341, 193-C1 (1991)
- DEAN, A. J. See UBERTINI, P., et al. "Superlow-State" Hard X-Ray Observation of Cygnus X-1.
- See BAZZANO, A., et al. Hard X-Rays from Coma Cluster Region: Erratum.
- See PEROTTI, F., et al. Hard X-Ray Variability of NGC 4151.
- DE ARAUJO, J. C. N. Collapse of Population III Objects Induced by Cold Collisionless Dark Matter. *J. C. N. de Araujo & R. Opher*. 379, 461, 170-D10 (1991)
- DEARBORN, DAVID. Window for the Dark Matter Solution to the Solar Neutrino Problem. *David Dearborn, Kim Griest, & Georg Raffelt*. 368, 626, 33-A1 (1991)
- DEARBORN, DAVID S. The Shock Process and Light-Element Production in Supernova Envelopes. *Lawrence E. Brown, David S. Dearborn, David N. Schramm, Jon T. Larsen, & Shin Kurokawa*. 371, 648, 69-F1 (1991)
- DE BERNARDIS, P. High-Latitude Galactic Emission and the Search for Anisotropies of the Cosmic Background Radiation. *S. Masi, P. de Bernardis, M. De Petris, M. Epifani, M. Gervasi, & G. Guarini*. 366, L51, 11-B1 (1991)
- Spatial Distribution of the Interplanetary Dust Deduced by Infrared Observations. *P. de Bernardis, F. Feminella, & G. Moreno*. 370, 396, 52-B10 (1991)
- DE BERNARDIS, PAOLO. Cosmic Microwave Background and Galactic Quadrupoles in the Millimeter Region. *Paolo de Bernardis, Silvia Masi, & Nicola Vittorio*. 382, 515, 208-A1 (1991)
- DE CARVALHO, R. R. Surface Photometry of a Sample of Elliptical and SO Galaxies. *R. R. de Carvalho, S. Djorgovski, & L. N. da Costa*. 76, 1067, 40-E1 (1991)
- DECHEZ, R. Infrared Mapping of M82: A Starburst in an Edge-on Barred Galaxy. *C. M. Telesco, H. Campins, M. Joy, K. Dietz, & R. Decher*. 369, 135, 37-E11 (1991)
- DECKER, R. E. Statistical Properties of Shock-accelerated Ions in the Outer Heliosphere. *L. J. Lanzerotti, R. E. Gold, D. J. Thomson, R. E. Decker, C. G. Maclennan, & S. M. Krimigis*. 380, L93, 188-F10 (1991)
- DEETER, JOHN E. Decrease in the Orbital Period of Hercules X-1. *John E. Deeter, Paul E. Boynton, Sigenori Miyamoto, Shunji Kitamoto, Fumiaki Nagase, & Nobuyuki Kawai*. 383, 324, 216-C1 (1991)
- DE FELICE, F. Massive Black Holes in the Nuclei of Spiral Galaxies: M31 and the Problem of the Initial Conditions. *M. Bradley, A. Curir, & F. de Felice*. 381, 72, 189-G11 (1991)
- DEFREES, D. J. Calculations Concerning the Reaction  $C + H_3^+ \rightarrow CH^+ + H_2$ . *D. Talbi, D. J. DeFrees, D. A. Egolf, & Eric Herbst*. 374, 390, 103-A1 (1991)
- DE GEUS, E. J. A 21 Centimeter Line Survey of a Region around Four Outer Galaxy Open Clusters. *D. Leisawitz & E. J. de Geus*. 75, 835, 13-E1 (1991)
- DEGIACOMI, C. G. Distribution of Dust about  $\alpha$  Ceti and  $\alpha$  Orionis Based on 11 Micron Spatial Interferometry. *M. Bester, W. C. Danchi, C. G. Degiacomi, C. H. Townes, & T. R. Geballe*. 367, L27, 17-E1 (1991)
- DEHARVENG, J. M. See MACCHETTO, F., et al. First Results from the Faint Object Camera: Observations of PKS 0521-36.
- See CRANE, P., et al. First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305.
- See JAKOBSEN, P., et al. First Results from the Faint Object Camera: SN 1987A.
- See PARESC, F., et al. First Results from the Faint Object Camera: Imaging the Core of R Aquarii.
- See MACCHETTO, F., et al. *HST* Observations of 3C 66B: A Double-stranded Optical Jet.
- See ALBRECHT, R., et al. First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System.
- See WEIGELT, G., et al. First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.
- DE JAGER, O. C. No Evidence for TeV Gamma Radiation from 2CG 006-00. *H. I. Nel, B. C. Raubenheimer, O. C. de Jager, R. Buccieri, M. Busetta, A. R. North, & C. Brink*. 368, 585, 32-D4 (1991)
- DE JAGER, O. C. The Unusual X-Ray Pulse Timing of AE Aquarii. *O. C. de Jager*. 378, 286, 154-E1 (1991)
- DEKEL, AVISHAI. Filamentary Superclustering in a Universe Dominated by Cold Dark Matter. *Michael J. West, Jens V. Villumsen, & Avishai Dekel*. 369, 287, 41-C7 (1991)
- Cosmological Velocity-Density Relation in the Quasi-linear Regime. *Adi Nusser, Avishai Dekel, Edmund Bertschinger, & George R. Blumenthal*. 379, 6, 163-B7 (1991)
- DEKHANOV, I. See BOUCHET, L., et al. SIGMA Discovery of Variable  $e^+e^-$  Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7-2942.
- See SUNYAEV, R., et al. Three Spectral States of 1E 1740.7-2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature.
- DE KOOL, MARTIJN. Outflows Driven by Cosmic-Ray Pressure in Broad Absorption Line QSOs. *Mitchell C. Begelman, Marijn de Kool, & Marek Sikora*. 382, 416, 206-F9 (1991)
- DE LAPPARENT, VALÉRIE. Measures of Large-Scale Structure in the CfA Redshift Survey Slices. *Valérie de Lapparent, Margaret J. Geller, & John P. Huchra*. 369, 273, 41-B5 (1991)

- DELGADO, ANTONIO J. Topography of the Galactic Disk: Z-Structure and Large-Scale Star Formation. *Emilio J. Alfaro, Jesús Cabrera-Caño, & Antonio J. Delgado.* 378, 106, 152-C10 (1991)
- DELTISKY, M. L. See KRISHER, T. P., et al. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of *Voyager 2*.
- DELIYANNIS, CONSTANTINE P. Evolutionary Models of Halo Stars with Rotation. I. Evidence for Differential Rotation with Depth in Stars. *Marc H. Pinsonneault, Constantine P. Deliyannis, & Pierre Demarque.* 367, 239, 15-A12 (1991)
- Lithium in the Most Extreme Halo Stars; Trends with Metallicity. *Constantine P. Deliyannis & Pierre Demarque.* 370, L89, 59-E5 (1991)
- Lithium in Halo Stars: Constraining the Effects of Helium Diffusion on Globular Cluster Ages and Cosmology. *Constantine P. Deliyannis & Pierre Demarque.* 379, 216, 165-F7 (1991)
- DELLA CECÀ, ROBERTO. The Properties of X-Ray-selected Active Galactic Nuclei. I. Luminosity Function, Cosmological Evolution, and Contribution to the Diffuse X-Ray Background. *Tommaso Maccacaro, Roberto Della Ceca, Isabella M. Gioia, Simon L. Morris, John T. Stocke, & Anna Wolter.* 374, 117, 99-D11 (1991)
- The Luminosity Function and Cosmological Evolution of X-Ray-selected BL Lacertae Objects. *Simon L. Morris, John T. Stocke, Isabella M. Gioia, Rudy E. Schild, Anna Wolter, Tommaso Maccacaro, & Roberto Della Ceca.* 380, 49, 176-F1 (1991)
- DEL POZO-SANZ, R. Luminosity Segregation as an Indication of Dynamical Evolution in Rich Clusters of Galaxies. *G. Yépes, R. Dominguez-Tenreiro, & R. del Pozo-Sanz.* 373, 336, 92-B13 (1991)
- DE LUCIA, FRANK C. Millimeter- and Submillimeter-Wave Spectrum of Highly Excited States of Water. *J. C. Pearson, Todd Anderson, Eric Herbst, Frank C. De Lucia, & Paul Helminger.* 379, L41, 169-D12 (1991)
- DEMARQUE, P. The Effect of the Mihalas, Hummer, and Däppen Equation of State and the Molecular Opacity on the Standard Solar Model. *Y.-C. Kim, P. Demarque, & D. B. Guenther.* 378, 407, 156-A10 (1991)
- DEMARQUE, PIERRE. Evolutionary Models of Halo Stars with Rotation. I. Evidence for Differential Rotation with Depth in Stars. *Marc H. Pinsonneault, Constantine P. Deliyannis, & Pierre Demarque.* 367, 239, 15-A12 (1991)
- Lithium in the Most Extreme Halo Stars; Trends with Metallicity. *Constantine P. Deliyannis & Pierre Demarque.* 370, L89, 59-E5 (1991)
- Lithium in Halo Stars: Constraining the Effects of Helium Diffusion on Globular Cluster Ages and Cosmology. *Constantine P. Deliyannis & Pierre Demarque.* 379, 216, 165-F7 (1991)
- DEMERS, SERGE. The H I Content of the Local Group Dwarf (Spherical or Irregular?) Galaxy Phoenix. *Claude Carignan, Serge Demers, & Stéphanie Côté.* 381, L13, 194-C1 (1991)
- DEMIAŃSKI, MAREK. Deep Galactic Surveys and the Structure of the Universe. *Olga E. Buryak, Marek Demiański, & Andrej G. Doroshkevich.* 383, 41, 212-E1 (1991)
- DEMING, D. CN and HCN in the Infrared Spectrum of IRC +10216. *G. R. Wiedemann, Kenneth H. Hinkle, John J. Keady, D. Deming, & D. E. Jennings.* 382, 321, 204-B10 (1991)
- DE NATALE, P. Far-Infrared Fourier Transform Spectroscopy of  $^{12}\text{C}^{18}\text{O}$ . *P. De Natale, M. Inguscio, C. Rois Orza, & L. R. Zink.* 370, L53, 53-G5 (1991)
- DE NATALE, PAOLO. Pure Rotational Spectrum of Hydrogen Deuteride by Far-Infrared Fourier Transform Spectroscopy. *Lorenzo Ulivi, Paolo De Natale, & Massimo Inguscio.* 378, L29, 157-D7 (1991)
- DENN, GRANT R. Lithium Abundances in Carbon Stars. *Grant R. Denn, R. Earle Luck, & David L. Lambert.* 377, 657, 147-G5 (1991)
- DENNIS, B. R. SMM/HXRBS Observations of Cygnus X-1 from 1986 December to 1988 April. *R. A. Schwartz, L. E. Orwig, B. R. Dennis, J. C. Ling, & W. A. Wheaton.* 376, 312, 128-G1 (1991)
- DENNIS, BRIAN R. A Study of Solar Flare Energy Transport Based on Coordinated H $\alpha$  and X-Ray Observations. *Richard C. Canfield, Dominic M. Zarro, Jean-Pierre Wülser, & Brian R. Dennis.* 367, 671, 21-E11 (1991)
- DENSMORE, A. C. See KRISHER, T. P., et al. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of *Voyager 2*.
- DE OLIVEIRA, CLÁUDIA MENDES. The Luminosity Function of Compact Groups of Galaxies. *Cláudia Mendes de Oliveira & Paul Hickson.* 380, 30, 176-D5 (1991)
- DE PETRIS, M. High-Latitude Galactic Emission and the Search for Anisotropies of the Cosmic Background Radiation. *S. Masi, P. de Bernardis, M. De Petris, M. Epifani, M. Gervasi, & G. Guarini.* 366, L51, 11-B1 (1991)
- DEPOY, D. L. A 2.2 Micron Survey in the L1630 Molecular Cloud. *Elizabeth A. Lada, D. L. DePoy, Neal J. Evans II, & Ian Gailey.* 371, 171, 62-C1 (1991)
- Infrared Images of M17. *Charles J. Lada, D. L. DePoy, K. M. Merrill, & Ian Gailey.* 374, 533, 105-G1 (1991)
- Infrared Hot Spots in the Nucleus of NGC 253. *Duncan A. Forbes, Martin J. Ward, & D. L. DePoy.* 380, L63, 188-C6 (1991)
- D'ERCOLE, ANNIBALE. Winds, Outflows, and Inflows in X-Ray Elliptical Galaxies. I. *Luca Ciotti, Annibale D'Ercole, Silvia Pellegrini, & Alvio Renzini.* 376, 380, 131-B12 (1991)
- DERE, K. P. The Magnetic Network Location of Explosive Events Observed in the Solar Transition Region. *J. G. Porter & K. P. Dere.* 370, 775, 58-A11 (1991)
- Chromospheric and Transition Region Diagnostics Using Emission-Line Intensities. *R. Grant Athay & K. P. Dere.* 379, 776, 174-D1 (1991)
- Velocity Gradients in the Chromosphere-Corona Transition Region. *R. Grant Athay & K. P. Dere.* 381, 323, 193-A6 (1991)
- Relative Abundances in the Lower Solar Transition Region. *G. A. Doschek, K. P. Dere, & P. A. Lund.* 381, 583, 198-A1 (1991)
- DERMER, C. D. Luminosity Enhancement Factor for Thermal Comptonization and the Electron Energy Balance. *C. D. Dermer, E. P. Liang, & E. Canfield.* 369, 410, 42-G5 (1991)
- DERMER, CHARLES D. X-Ray Echoes from Gamma-Ray Bursts. *Charles D. Dermer, Kevin C. Hurley, & Dieter H. Hartmann.* 370, 341, 51-E1 (1991)
- A Theory of Gamma-Ray Bursts Based on Resonant Compton Scattering. *Peter Vitello & Charles D. Dermer.* 374, 668, 107-D1 (1991)
- Existence of Scattering Atmospheres near Luminous, Magnetized Compact Objects. *Charles D. Dermer & Steven J. Turner.* 382, L23, 205-C11 (1991)
- DE ROBERTIS, M. M. Spatially Resolved Spectroscopy of Lyman-Alpha and C IV in the Gravitational Lens 2237+030. *H. K. C. Yee & M. M. De Robertis.* 381, 386, 195-E1 (1991)
- DETTMAR, RALF-JÜRGEN. Extraplanar Ionized Gas and Kinematics in the Edge-on Galaxy NGC 891. *Jean W. Keppel, Ralf-Jürgen Dettmar, John S. Gallagher III, & Morton S. Roberts.* 374, 507, 105-D6 (1991)
- DEVEREUX, NICHOLAS A. The Rate and Efficiency of High-Mass Star Formation along the Hubble Sequence. *Nicholas A. Devereux & Judith S. Young.* 371, 515, 68-A1 (1991)
- Molecular Clouds in Starburst Galaxy Nuclei. *Judith S. Young & Nicholas A. Devereux.* 373, 414, 93-B6 (1991)
- DE VOLNAY, FRANÇOIS MARTIN. A Critical Look at Cosmions. *Jean Kaplan, François Martin de Volnay, Charling Tao, & Sylvaine Turck-Chièze.* 378, 315, 154-G11 (1991)
- DEVORE, C. RICHARD. Coronal Current-Sheet Formation: The Effect of Asymmetric and Symmetric Shears. *Judith T. Karpen, Spiro K. Antiochos, & C. Richard DeVore.* 382, 327, 204-C4 (1991)
- DEWDNEY, P. E. IRAS 23545+6508, a Dissociating Star: Prototype for a New Observational Class? *P. E. Dewdney, R. S. Roger, C. R. Purton, & W. H. McCutcheon.* 370, 243, 50-C1 (1991)
- An X-Ray and Radio Study of Steep-Spectrum Radio Sources. II. Four Fields from a 22 MHz Polar Cap Survey. *P. E. Dewdney, C. H. Costain, I. McHardy, A. G. Willis, D. E. Harris, & C. P. Stern.* 76, 1055, 40-D1 (1991)
- DEWEY, R. J. Discovery of a Young, 267 Millisecond Pulsar in the Supernova Remnant W44. *A. Wolszczan, J. M. Cordes, & R. J. Dewey.* 372, L99, 85-F1 (1991)
- DE YOUNG, DAVID S. The Deflection of Cosmic Jets. *David S. De Young.* 371, 69, 61-A1 (1991)

- DE ZEEUW, TIM. The Ring Instability in Radially Cold Oblate Galaxy Models. *Tim de Zeeuw & Martin Schwarzschild*. 369, 57, 36-F7 (1991)
- Testing the Gravitational Field in Elliptical Galaxies: NGC 5077. *Francesco Bertola, Daniela Bettoni, John Danziger, Elaine Sadler, Linda Sparke, & Tim de Zeeuw*. 373, 369, 92-E10 (1991)
- The Ordered Nature of Elliptical Galaxies: Implications for Their Intrinsic Angular Momenta and Shapes. *Marion Franx, Garth Illingworth, & Tim de Zeeuw*. 383, 112, 213-D7 (1991)
- DE ZOTTI, G. Constraints on the Thermal History of the Universe from the Cosmic Microwave Background Spectrum. *C. Burigana, G. De Zotti, & L. Danese*. 379, 1, 163-B1 (1991)
- Small-Scale Fluctuations and Angular Correlations of the X-Ray Background in the HEAO 1 A-2 Energy Band: Constraints on Clustering of X-Ray Sources. *J. M. Martin-Morales, G. De Zotti, E. A. Boldi, F. E. Marshall, L. Danese, A. Franceschini, & M. Persic*. 379, 507, 171-A4 (1991)
- DICKEL, H. R. NGC 7538 IRS 1: Subarcsecond Resolution Recombination Line and  $^{15}\text{NH}_3$  Maser Observations. *R. A. Gaume, K. J. Johnston, H. A. Nguyen, T. L. Wilson, H. R. Dickel, W. M. Goss, & M. C. H. Wright*. 376, 608, 133-G12 (1991)
- DICKEY, JOHN M. The Joint Far-Infrared-Optical Luminosity Function for Spiral Galaxies and Data for the Abell 400 and Cancer Clusters. *Edwige Corbelli, Edwin E. Salpeter, & John M. Dickey*. 370, 49, 47-F4 (1991)
- H I Mapping of Galaxies in the Cluster A1367. *John M. Dickey & Giuseppe Favazzini*. 373, 347, 92-C12 (1991)
- DICKINSON, DALE F. New OH Main-Line Detections of OH/IR Stars. *Dale F. Dickinson & B. E. Turner*. 75, 1323, 23-A9 (1991)
- Excitation of the Hydroxyl Maser in OH/IR Stars. *Dale F. Dickinson*. 379, L29, 169-C11 (1991)
- DICKMAN, ROBERT L. The Smoothness of CO Line Profiles in Orion: Implications for Clumpiness. *Jan A. Tauber, Paul F. Goldsmith, & Robert L. Dickman*. 375, 635, 120-E7 (1991)
- Star Counts and Carbon Monoxide Observations of Maddalena's Cloud. *Youngun Lee, Ronald L. Snell, & Robert L. Dickman*. 379, 639, 172-E11 (1991)
- DIERCKSEN, GEERD H. F. Theoretical Studies of the Absorption Spectra of Polycyclic Aromatic Hydrocarbons. *Sylvio Canuto, Michael C. Zerner, & Geerd H. F. Diercksen*. 377, 150, 139-G3 (1991)
- DIETRICH, M. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- DIETZ, K. Infrared Mapping of M82: A Starburst in an Edge-on Barred Galaxy. *C. M. Telesco, H. Campins, M. Joy, K. Dietz, & R. Decher*. 369, 135, 37-E11 (1991)
- DIMITRIJEVIĆ, M. S. Regularities of Stark Parameters along the Periodic Table. *J. Purić, M. Ćuk, M. S. Dimitrijević, & A. Lesage*. 382, 353, 204-E7 (1991)
- DIMOPOULOS, SAVAS. Primordial Nucleosynthesis without a Computer. *Rahim Esmailezadeh, Glenn D. Starkman, & Savas Dimopoulos*. 378, 504, 158-F7 (1991)
- DINGUS, B. L. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- DION, C. L. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- DIÓN, G. M. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- DIPLAS, ATHANASSIOS. Neutral Hydrogen in the Outer Galaxy. *Athanassios Diplas & Blair D. Savage*. 377, 126, 139-E5 (1991)
- DIPPER, N. See UBERTINI, P., et al. "Superlow-State" Hard X-Ray Observation of Cygnus X-1.
- DIPPER, N. A. See BAZZANO, A., et al. Hard X-Rays from Coma Cluster Region: Erratum.
- See PEROTTI, F., et al. Hard X-Ray Variability of NGC 4151.
- DI PRISCO, A. Conformally Symmetric Spheres in the Thin Wall Approximation: Erratum. *L. Herrera, J. Ibáñez, & A. Di Prisco*. 376, 367, 129-D12 (1991) (Orig. paper in 353, 579, 71-B4 (1990))
- The Effects of Thermal Radiation on Some General Relativistic Stellar Models. *J. M. Aguirregabiria, J. Ibáñez, A. Di Prisco, & L. Herrera*. 376, 662, 134-E8 (1991)
- DI SANTI, MICHAEL A. Comet P/Halley: Spatial Distributions and Scale Lengths for  $\text{C}_2$ , CN,  $\text{NH}_2$ , and  $\text{H}_2\text{O}$ . *Uwe Fink, Michael R. Combi, & Michael A. DiSanti*. 383, 356, 216-F9 (1991)
- DISCENNA, JENNIFER L. The 10 Year Radio Light Curves for SN 1979C. *Kurt W. Weiler, Schuyler D. Van Dyk, Nino Panagia, Richard A. Sramek, & Jennifer L. Discenna*. 380, 161, 178-B1 (1991)
- DISNEY, M. J. See MACCHETTO, F., et al. First Results from the Faint Object Camera: Observations of PKS 0521-36.
- See CRANE, P., et al. First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305.
- See JAKOBSEN, P., et al. First Results from the Faint Object Camera: SN 1987A.
- See PARESC, F., et al. First Results from the Faint Object Camera: Imaging the Core of R Aquarii.
- See MACCHETTO, F., et al. *HST* Observations of 3C 66B: A Double-stranded Optical Jet.
- See ALBRECHT, R., et al. First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System.
- See WEIGELT, G., et al. First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.
- DIXON, W. V. See FELDMAN, P. D., et al. Observations of Comet Levy (1990c) with the Hopkins Ultraviolet Telescope.
- See MOOS, H. W., et al. Determination of Ionic Abundances in the Io Torus Using the Hopkins Ultraviolet Telescope.
- DIXON, W. VAN DYKE. See LONG, KNOX S., et al. Spectroscopy of Z Camelopardalis in Outburst with the Hopkins Ultraviolet Telescope.
- See FERGUSON, HENRY C., et al. Constraints on the Origin of the Ultraviolet Upturn in Elliptical Galaxies from Hopkins Ultraviolet Telescope Observations of NGC 1399.
- DJORGOVSKI, S. Optical and Radio Observations of the Binary Pulsar 1855+09: Evolution of Pulsar Magnetic Fields and Low-Mass White Dwarf Cooling. *S. R. Kulkarni, S. Djorgovski, & A. R. Klemola*. 367, 221, 14-G4 (1991)
- Discovery of a Normal Galaxy at  $z = 1.018$ . *D. J. Thompson & S. Djorgovski*. 371, L55, 73-B6 (1991)
- Modification of Stellar Populations in Post-Core-Collapse Globular Clusters. *S. Djorgovski, G. Piotto, E. S. Phinney, & D. F. Chernoff*. 372, L41, 79-E11 (1991)
- Discovery of an Infrared Nucleus in Cygnus A: An Obscured Quasar Revealed? *S. Djorgovski, N. Weis, K. Matthews, & J. R. Graham*. 372, L67, 85-C5 (1991)
- Surface Photometry of a Sample of Elliptical and S0 Galaxies. *R. R. de Carvalho, S. Djorgovski, & L. N. da Costa*. 76, 1067, 40-E1 (1991)
- DOBROZYCKI, ADAM. A  $\sim 10$  Mpc Void in the Ly $\alpha$  Forest at  $z = 3.17$ . *Adam Dobrozycki & Jill Bechtold*. 377, L69, 150-B10 (1991)
- DOLEZ, N. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- DOMÍNGUEZ-TENREIRO, R. Luminosity Segregation as an Indication of Dynamical Evolution in Rich Clusters of Galaxies. *G. Yépes, R. Domínguez-Tenreiro, & R. del Pozo-Sanz*. 373, 336, 92-B13 (1991)
- DOMINIK, KURT G. Gravitational Clustering in the Expanding Universe: Controlled High-Resolution Studies in Two Dimensions. *John Francis Beacom, Kurt G. Dominik, Adrian L. Melott, Sam P. Perkins, & Sergei F. Shandarin*. 372, 351, 80-B7 (1991)
- DONAHUE, MEGAN. New Observations of the Gas Cloud Associated with the Quasar-Galaxy Pair 3C 232/NGC 3067. *John T. Stocke, James Case, Megan Donahue, J. Michael Shull, & Theodore P. Snow*. 374, 72, 98-G7 (1991)
- A Photoionization Model for the Optical Line Emission from Cooling Flows. *Megan Donahue & G. Mark Voit*. 381, 361, 195-C1 (1991)
- New Photoionization Models of Intergalactic Clouds. *Megan Donahue & J. Michael Shull*. 383, 511, 220-F1 (1991)
- DONAHUE, ROBERT A. Interpreting Epsilon Aurigae. *Sean M. Carroll, Edward F. Guinan, George P. McCook, & Robert A. Donahue*. 367, 278, 15-E1 (1991)

- DONN, B. Desorption of Large Molecules from Grains in Dense Interstellar Clouds. *R. E. Johnson, V. Pironello, B. Sundqvist, & B. Donn.* 379, L75, 175-D12 (1991)
- DOPITA, M. A. Photoionization Modeling of Magellanic Cloud Planetary Nebulae. I. *M. A. Dopita & S. J. Meatheringham.* 367, 115, 13-D6 (1991)
- LMC SMP 64: The Youngest Planetary Nebula? *M. A. Dopita & S. J. Meatheringham.* 374, L21, 103-E1 (1991)
- Photoionization Modeling of Magellanic Cloud Planetary Nebulae. II. *M. A. Dopita & S. J. Meatheringham.* 377, 480, 145-F6 (1991)
- DOPITA, MICHAEL A. Optical Spectroscopy of Magellanic Cloud Planetary Nebulae. I. *Stephen J. Meatheringham & Michael A. Dopita.* 75, 407, 6-C9 (1991)
- Optical Spectroscopy of Magellanic Cloud Planetary Nebulae. II. *Stephen J. Meatheringham & Michael A. Dopita.* 76, 1085, 40-F7 (1991)
- DORMAN, BEN. On Equation of State Interpolation Errors in Stellar Interior Calculations. *Ben Dorman, Alan W. Irwin, & Brian B. Pedersen.* 381, 228, 191-G4 (1991)
- DOROSHKEVICH, A. G. Fluctuations of the Microwave Background Radiation on Large and Intermediate Angular Scales. *F. Atrio-Barandela, A. G. Doroshkevich, & A. A. Klypin.* 378, 1, 151-A11 (1991)
- DOROSHKEVICH, ANDREJ G. Deep Galactic Surveys and the Structure of the Universe. *Olga E. Buryak, Marek Demiański, & Andrej G. Doroshkevich.* 383, 41, 212-E1 (1991)
- DOSCHEK, G. A. The Solar Spectrum between 914 and 1177 Å. *U. Feldman & G. A. Doschek.* 75, 925, 14-B13 (1991)
- Relative Abundances in the Lower Solar Transition Region. *G. A. Doschek, K. P. Dere, & P. A. Lund.* 381, 583, 198-A1 (1991)
- DOTANI, T. See TAN, J., et al. Changes in the 11 Minute Period of 4U 1820-30.
- See NAGASE, F., et al. Cyclotron Line Features in the Spectrum of the Transient X-Ray Pulsar X0115+634.
- DOTANI, TADAYASU. X-Ray Variability of GX 339-4 in Its Very High State. *Signori Miyamoto, Kazuhiko Kimura, Shunji Kitamoto, Tadayasu Dotani, & Ken Ebisawa.* 383, 784, 224-A3 (1991)
- DOTTORI, H. Detection of the Helium Flash Gap in the Integrated ( $U - B$ ) versus ( $B - V$ ) Diagram for 624 Large Magellanic Cloud Clusters. *E. Bica, J. J. Clariá, H. Dottori, J. F. C. Santos, Jr., & A. Piatí.* 381, L51, 199-C7 (1991)
- DOWNES, D. CO Excitation and  $H_2$  Masses of Infrared-luminous Galaxies. *Simon J. E. Radford, P. M. Solomon, & D. Downes.* 368, L15, 28-C7 (1991)
- DOWNES, RONALD A. Faint Object Camera Observations of a Globular Cluster Nova Field. *Bruce Margon, Scott F. Anderson, Ronald A. Downes, Ralph C. Bohlin, & Peter Jakobsen.* 369, L71, 46-C1 (1991)
- DRAINE, B. T. Supernova Remnants in Dense Clouds. I. Blast-Wave Dynamics and X-Ray Irradiation. *B. T. Draine & D. T. Woods.* 383, 621, 222-A6 (1991)
- DRAKE, STEPHEN A. X-Ray Emission from Hybrid-Chromosphere Stars. *Alexander Brown, Stephen A. Drake, Michael E. Van Steenberg, & Jeffrey L. Linsky.* 373, 614, 95-E9 (1991)
- DRAPATZ, S. High-Resolution Imaging of Brackett-γ and  $H_2$  1-0 S(1) Emission in the Seyfert Galaxy NGC 1068. *V. Rotaciuc, A. Krabbe, M. Cameron, S. Drapatz, R. Genzel, A. Sternberg, & J. W. V. Storey.* 370, L23, 53-D6 (1991)
- A Cluster of He I Emission-Line Stars in the Galactic Center. *A. Krabbe, R. Genzel, S. Drapatz, & V. Rotaciuc.* 382, L19, 205-C1 (1991)
- DRECHSEL, H. Multiwavelength Observations of Nova LMC 1990 Number 2: The First Extragalactic Recurrent Nova. *Steven N. Shore, George Sonneborn, Sumner G. Starrfield, M. Hamuy, R. E. Williams, A. Cassatella, & H. Drechsel.* 370, 193, 49-E8 (1991)
- DREHER, J. W. Multifrequency Radio Observations of Cygnus A: Spectral Aging in Powerful Radio Galaxies. *C. L. Carilli, R. A. Perley, J. W. Dreher, & J. P. Leahy.* 383, 554, 221-B9 (1991)
- DRESSLER, L. Faint Object Spectrograph Observations of the Low-Luminosity Seyfert Galaxy NGC 1566. *G. A. Kriss, G. F. Harig, L. Armus, William P. Blair, S. Caganoff, & L. Dressler.* 377, L13, 143-C1 (1991)
- DRESSLER, ALAN. The Supergalactic Plane Redshift Survey. *Alan Dressler.* 75, 241, 4-C1 (1991)
- New Velocity Dispersions and Photometry for E and S0 Galaxies in the Great Attractor. *Alan Dressler, S. M. Faber, & David Burstein.* 368, 54, 23-G1 (1991)
- The Galaxy Two-Point Correlation Function Down to  $V = 26$  Magnitudes on 0.5' Scales. *Lyman W. Neuschaefer, Rogier A. Windhorst, & Alan Dressler.* 382, 32, 200-D12 (1991)
- DRILLING, J. S. UBV Photometry of OB<sup>+</sup> Stars in the Southern Milky Way. *J. S. Drillings.* 76, 1033, 39-C11 (1991)
- DUBATH, P. Two High-Velocity Stars Shot Out from the Core of the Globular Cluster 47 Tucanae. *G. Meylan, P. Dubath, & M. Mayor.* 383, 587, 221-E4 (1991)
- DUBINSKI, JOHN. Cluster Infall with Friction. *R. G. Carlberg & John Dubinski.* 369, 13, 36-B11 (1991)
- The Structure of Cold Dark Matter Halos. *John Dubinski & R. G. Carlberg.* 378, 496, 158-E11 (1991)
- DUFOUR, R. J. Observation of a Pulsar Wind: CCD Polarimetry of the Crab Nebula. *F. C. Michel, P. A. Scowen, R. J. Dufour, & J. J. Hester.* 368, 463, 30-G1 (1991)
- DUFONT, P. L. Fe XIV Line Ratios in the Sun. *F. P. Keenan, P. L. Dufont, M. B. Boylan, A. E. Kingston, & K. G. Widing.* 373, 695, 96-E13 (1991)
- IUE Observations of Early-Type Stars at High Galactic Latitudes. *D. A. Quin, P. J. F. Brown, E. S. Conlon, P. L. Dufont, & F. P. Keenan.* 375, 342, 115-B7 (1991)
- The  $3s^2 3p^2 3s 3p^2 4P$  Intercombination Lines of Fe XIV in the Sun. *F. P. Keenan, P. L. Dufont, E. S. Conlon, M. B. Boylan, A. E. Kingston, & K. G. Widing.* 379, 406, 168-A11 (1991)
- Improved Line Ratio Calculations Involving  $\Delta n = 1$  (2-3) Transitions in O V and a Reanalysis of *Skylab* Observations of Solar Flares. *F. P. Keenan, P. L. Dufont, L. K. Harral, E. S. Conlon, K. A. Berrington, A. E. Kingston, & K. G. Widing.* 382, 349, 204-E1 (1991)
- DUGAD, S. R. See ADARKAR, H., et al. Search for High-Energy Neutrinos from Celestial Sources in the Kolar Gold Fields Experiment.
- DULK, G. A. Interrelation of Soft and Hard X-Ray Emissions during Solar Flares. I. Observations. *R. M. Winglee, A. L. Kiplinger, D. M. Zarro, G. A. Dulk, & J. R. Lemen.* 375, 366, 115-D13 (1991)
- Interrelation of Soft and Hard X-Ray Emissions during Solar Flares. II. Simulation Model. *R. M. Winglee, G. A. Dulk, P. L. Bornmann, & J. C. Brown.* 375, 382, 115-F1 (1991)
- DUNCAN, DOUGLAS K. Ca II H and K Measurements Made at Mount Wilson Observatory, 1966-1983. *Douglas K. Duncan, Arthur H. Vaughan, Olin C. Wilson, George W. Preston, James Frazer, Howard Lanning, Anthony Misch, Jean Mueller, David Soymen, L. Woodard, Sallie L. Balaunas, Robert W. Noyes, Lee W. Hartmann, Alain Porter, Cornelis Zwaan, Frans Middelkoop, René G. M. Ruttens, & Dimitri Mihalas.* 76, 383, 29-G9 (1991)
- The Lithium Abundance of the T Tauri Star BP Tauri. *Douglas K. Duncan.* 373, 250, 89-B1 (1991)
- The Chromospheric Emission-Age Relation for Stars of the Lower Main Sequence and Its Implications for the Star Formation Rate. *David R. Soderblom, Douglas K. Duncan, & Dean R. H. Johnson.* 375, 722, 121-F5 (1991)
- DUNCAN, ROBERT C. Expansion-cooled Lyman-Alpha Clouds. *Robert C. Duncan, Ethan T. Vishniac, & Jeremiah P. Ostriker.* 368, L1, 28-B1 (1991)
- Evidence for a Massive, Dark Gravitational Lensing Object in Q2345+007. *Robert C. Duncan.* 375, L41, 124-B1 (1991)
- DUNCAN, WILLIAM D. NGC 1333 IRAS 4: A Very Young, Low-Luminosity Binary System. *Göran Sandell, Colin Aspin, William D. Duncan, Adrian P. G. Russell, & E. Ian Robson.* 376, L17, 130-C1 (1991)
- Are FU Orionis Stars Younger than T Tauri Stars? Submillimeter Constraints on Circumstellar Disks. *David A. Weintraub, Göran Sandell, & William D. Duncan.* 382, 270, 203-E8 (1991)
- DUNCOMBE, R. L. See FRANZ, O. G., et al. Binary Star Observations with the *Hubble Space Telescope* Fine Guidance Sensors. I. ADS 11300.
- DURGAPRASAD, N. Ionization States of the Anomalous Cosmic Rays. *R. K. Singh, Banashree Mitra, N. Durgaprasad, S. Biswas, M. N. Vahia, J. S. Yadav, A. Dutta, & J. N. Goswami.* 374, 753, 108-D7 (1991)

- DURSEN, RICHARD H. Dynamical and Luminosity Evolution of Active Galactic Nuclei: Models with a Mass Spectrum. *Brian W. Murphy, Haldan N. Cohn, & Richard H. Durisen.* 370, 60, 47-G1 (1991)
- DURNEY, BERNARD R. Observational Constraints on Theories of the Solar Differential Rotation. *Bernard R. Durney.* 378, 378, 155-F1 (1991)
- DURRANCE, S. T. See FELDMAN, P. D., et al. Observations of Comet Levy (1990c) with the Hopkins Ultraviolet Telescope.
- SEE MOOS, H. W., et al. Determination of Ionic Abundances in the Io Torus Using the Hopkins Ultraviolet Telescope.
- DURRANCE, SAMUEL T. See BLAIR, WILLIAM P., et al. Discovery of a Fast Radiative Shock Wave in the Cygnus Loop Using the Hopkins Ultraviolet Telescope.
- SEE LONG, KNOX S., et al. Spectroscopy of Z Camelopardalis in Outburst with the Hopkins Ultraviolet Telescope.
- SEE FERGUSON, HENRY C., et al. Constraints on the Origin of the Ultraviolet Upturn in Elliptical Galaxies from Hopkins Ultraviolet Telescope Observations of NGC 1399.
- DUTTA, A. Ionization States of the Anomalous Cosmic Rays. *R. K. Singh, Banashree Mitra, N. Durgaprasad, S. Biswas, M. N. Vahia, J. S. Yadav, A. Dutta, & J. N. Goswami.* 374, 753, 108-D7 (1991)
- DUVALL, T. L., JR. Wavelength Variation of *p*-Mode Intensity Fluctuations. *R. S. Ronan, J. W. Harvey, & T. L. Duvall, Jr.* 369, 549, 44-E9 (1991)
- Power Spectra of Solar Convection. *D.-Y. Chou, B. J. LaBonte, D. C. Braun, & T. L. Duvall, Jr.* 372, 314, 77-G5 (1991)
- Measurements of High-Frequency Solar Oscillation Modes. *T. L. Duvall, Jr., J. W. Harvey, S. M. Jefferies, & M. A. Pomerantz.* 373, 308, 89-G1 (1991)
- Characteristics of Intermediate-Degree Solar *p*-Mode Line Widths. *S. M. Jefferies, T. L. Duvall, Jr., J. W. Harvey, Y. Osaki, & M. A. Pomerantz.* 377, 330, 142-A11 (1991)
- DWEK, ELI. An Infrared Analysis of Puppis A. *Richard G. Arendt, Eli Dwek, & Robert Petre.* 368, 474, 31-A7 (1991)
- DYACHKOV, A. See BARRET, D., et al. Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2.
- DYER, CHARLES C. A Technique for Using Radio Jets as Extended Gravitational Lensing Probes. *Philipp P. Kronberg, Charles C. Dyer, E. Margaret Burbidge, & Vespa T. Junkkarinen.* 367, L1, 17-B1 (1991)
- DZIEMBOWSKI, W. A. What We Know about the Sun's Internal Rotation from Solar Oscillations. *Philip R. Goode, W. A. Dziembowski, S. G. Korzennik, & E. J. Rhodes, Jr.* 367, 649, 21-C11 (1991)
- Seismology for the Fine Structure in the Sun's Oscillations Varying with Its Activity Cycle. *W. A. Dziembowski & Philip R. Goode.* 376, 782, 136-B1 (1991)
- EALES, S. A. Infrared Emission Regions in the Interacting Galaxy System Arp 299. *C. G. Wynn-Williams, S. A. Eales, E. E. Becklin, K.-W. Hodapp, R. D. Joseph, I. S. McLean, D. A. Simons, & G. S. Wright.* 377, 426, 145-A13 (1991)
- EARDLEY, DOUGLAS M. Polarization Properties of Emission Lines from Relativistic Accretion Disks. *Kaiyou Chen & Douglas M. Eardley.* 382, 125, 201-F10 (1991)
- EATON, JOEL A. Mass Loss in the 96 Day Binary UU Cancri. *Joel A. Eaton, Douglas S. Hall, & R. Kent Honeycutt.* 376, 289, 128-E1 (1991)
- EBBETS, D. See HUTCHINGS, J. B., et al. First Results from the Goddard High-Resolution Spectrograph: Ultraviolet Spectra of a Starburst Knot in NGC 1068.
- See HEAP, S. R., et al. First Results from the Goddard High-Resolution Spectrograph: Spectroscopic Determination of Stellar Parameters of Melnick 42, an O3f Star in the Large Magellanic Cloud.
- EBBETS, DENNIS C. First Results from the Goddard High-Resolution Spectrograph: A Demonstration of Spectral Resolution and Experiments with Deconvolution. *Glenn M. Wahlgren, David S. Leckrone, Steven N. Shore, Don J. Lindler, Ronald L. Gilliland, & Dennis C. Ebbets.* 377, L41, 143-E6 (1991)
- First Results from the Goddard High-Resolution Spectrograph: The Chromosphere of  $\alpha$  Tauri. *Kenneth G. Carpenter, Richard D. Robinson, Glenn M. Wahlgren, Thomas B. Ake, Dennis C. Ebbets, Jeffrey L. Linsky, Alexander Brown, & Frederick M. Walter.* 377, L45, 143-E11 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Resolved Velocity and Density Structure in the  $\beta$  Pictoris Circumstellar Gas. *A. Bogess, Frederick C. Bruhweiler, C. A. Grady, Dennis C. Ebbets, Yoji Kondo, L. M. Trafton, John C. Brandt, & S. R. Heap.* 377, L49, 143-F1 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Element Abundances as Function of Velocity in the Neutral Gas toward  $\xi$  Persei. *Blair D. Savage, Jason A. Cardelli, Frederick C. Bruhweiler, Andrew M. Smith, Dennis C. Ebbets, & Kenneth R. Sembach.* 377, L53, 143-F6 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Elemental Abundances in the Diffuse Clouds toward  $\xi$  Persei. *Jason A. Cardelli, Blair D. Savage, Frederick C. Bruhweiler, Andrew M. Smith, Dennis C. Ebbets, Kenneth R. Sembach, & Ulysses J. Sofia.* 377, L57, 143-F11 (1991)
- First Results from the Goddard High-Resolution Spectrograph: C1, Si, and CO toward  $\xi$  Persei and the Physical Conditions in Diffuse Clouds. *Andrew M. Smith, Frederick C. Bruhweiler, David L. Lambert, Blair D. Savage, Jason A. Cardelli, Dennis C. Ebbets, Cheng-Hsuan Lyu, & Yaron Sheffer.* 377, L61, 143-G1 (1991)
- Interstellar Gas Phase Abundance of Carbon, Oxygen, Nitrogen, Copper, Gallium, Germanium, and Krypton toward  $\zeta$  Ophiuchi. *Jason A. Cardelli, Blair D. Savage, & Dennis C. Ebbets.* 383, L23, 219-D1 (1991)
- EBISAWA, K. See COWLEY, A. P., et al. Discovery of a Long-Term Periodic Variation in LMC X-3.
- EBISAWA, KEN. Application of a General Relativistic Accretion Disk Model to LMC X-1, LMC X-3, X1608-522, and X1636-536. *Ken Ebisawa, Kazuhisa Mitsuda, & Tomoyuki Hanawa.* 367, 213, 14-F8 (1991)
- X-Ray Variability of GX 339-4 in Its Very High State. *Sigenori Miyamoto, Kazuhiro Kimura, Shunji Kitamoto, Tadayasu Dotani, & Ken Ebisawa.* 383, 784, 224-A3 (1991)
- ECKART, A. The Molecular Interstellar Medium and the Near-Infrared Continuum of the Barred LINER NGC 6764. *A. Eckart, M. Cameron, J. M. Jackson, R. Genzel, A. I. Harris, W. Wild, & H. Zinnecker.* 372, 67, 74-G9 (1991)
- ECKART, ANDREAS. The Interstellar Medium of the Hot-Spot Galaxy NGC 2903. *James M. Jackson, Andreas Eckart, Murray Cameron, Wolfgang Wild, Paul T. Ho, Richard W. Pogge, & Andrew I. Harris.* 375, 105, 112-C9 (1991)
- EDELSON, R. A. Ultraviolet Variability of NGC 5548: Dynamics of the Continuum Production Region and Geometry of the Broad-Line Region. *J. H. Krolik, Keith Horne, T. R. Kallman, M. A. Malkan, R. A. Edelson, & G. A. Kriss.* 371, 541, 68-C6 (1991)
- Rapid Ultraviolet Variability in the BL Lacertae Object PKS 2155-304. *R. A. Edelson, J. Saken, G. Pike, C. M. Urry, I. M. George, R. S. Warwick, H. R. Miller, M. T. Carini, & J. R. Webb.* 372, L9, 79-B5 (1991)
- EDWARDSSON, BENGT. First Detection of Beryllium in a Very Metal Poor Star: A Test of the Standard Big Bang Model. *Gerard Gilmore, Bengt Edwardsson, & P. E. Nissen.* 378, 17, 151-C1 (1991)
- EDWARDS, B. C. Limits on the Density of Neutral Gas within 100 Parsecs from Observations of the Soft X-Ray Background. *M. Juda, J. J. Bloch, B. C. Edwards, D. McCammon, W. T. Sanders, S. L. Snowden, & J. Zhang.* 367, 182, 14-C8 (1991)
- EDWARDS, SUZAN. Optical Excess Emission in T Tauri Stars. *Patrick Hartigan, Scott J. Kenyon, Lee Hartmann, Stephen E. Strom, Suzan Edwards, Alan D. Wely, & John Stauffer.* 382, 617, 209-C1 (1991)
- Efstathiou, G. Excursion Set Mass Functions for Hierarchical Gaussian Fluctuations. *J. R. Bond, S. Cole, G. Efstathiou, & N. Kaiser.* 379, 440, 170-C1 (1991)
- The Clustering of Faint Galaxies. *G. Efstathiou, G. Bernstein, N. Katz, J. A. Tyson, & P. Guhathakurta.* 380, L47, 188-B1 (1991)
- EGAN, MICHAEL P. Radiation Transport in Dust in Disk Geometry. I. Application to Externally Heated Interstellar Clouds. *George E. Spagna, Jr., Chun Ming Leung, & Michael P. Egan.* 379, 232, 166-A5 (1991)
- On the Nature of the Excess 100 Micron Flux Associated with Carbon Stars. *Michael P. Egan & Chun Ming Leung.* 383, 314, 216-B1 (1991)

- EGGLETON, P. P. A Conjecture Regarding the Evolution of Dwarf Stars into Red Giants. *P. P. Eggleton & R. C. Cannon.* 383, 757, 223-E12 (1991)
- EGOLF, D. A. Calculations Concerning the Reaction  $C + H_3^+ \rightarrow CH^+$  +  $H_2$ . *D. Talbi, D. J. DeFrees, D. A. Egolf, & Eric Herbst.* 374, 390, 103-A1 (1991)
- EICHLER, DAVID. Mechanisms for Pulsar Eclipse. *David Eichler.* 370, L27, 53-D11 (1991)
- Can Neutron Stars Ablate Their Companions? *Amir Levinson & David Eichler.* 379, 359, 167-E1 (1991)
- EINAUDI, G. Hydrodynamics of the Hot Component of the Galactic Halo. I. Steady State Solutions. *G. Einaudi & A. Ferrara.* 371, 571, 68-E12 (1991)
- EISLÖFFEL, J. The High State of the FU Orionis Variable Z Canis Majoris. *F. V. Hessman, J. Eisloffel, R. Mundt, L. W. Hartmann, W. Herbst, & J. Krautter.* 370, 384, 52-A10 (1991)
- EISLÖFFEL, JOCHEN. An Optical/Infrared Outburst in the Exciting Source of HH 7-11. *Jochen Eisloffel, Eike Günther, Frederic V. Hessman, Reinhard Mundt, Ralf Poezitz, John S. Carr, Steven Beckwith, & Tom P. Ray.* 383, L19, 219-C7 (1991)
- ELBERT, J. W. See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- ELITZUR, MOSHE. Radiative Transfer in Astronomical Masers. III. Filamentary Masers. *Moshe Elitzur, Christopher F. McKee, & David J. Hollenbach.* 367, 333, 16-B10 (1991)
- Polarization of Astronomical Maser Radiation. *Moshe Elitzur.* 370, 407, 52-C12 (1991)
- Fluctuations in Astronomical Masers. *Moshe Elitzur.* 370, L45, 53-F6 (1991)
- ELLINGER, Y. Is Interstellar Detection of Higher Members of the Linear Radicals  $C_nCH$  and  $C_nN$  Feasible? *F. Pauzat, Y. Ellinger, & A. D. McLean.* 369, L13, 40-B11 (1991)
- ELLINGSON, E. Quasars and Active Galactic Nuclei in Rich Environments. II. The Evolution of Radio-loud Quasars. *E. Ellingson, H. K. C. Yee, & R. F. Green.* 371, 49, 60-F7 (1991)
- Quasars and Active Galactic Nuclei in Rich Environments. I. Fields Surrounding Optically Faint Quasars. *E. Ellingson, H. K. C. Yee, & R. F. Green.* 76, 455, 31-D2 (1991)
- Clusters of Galaxies Associated with Quasars. II. Galaxy Cluster Dynamics. *E. Ellingson, R. F. Green, & H. K. C. Yee.* 378, 476, 158-D1 (1991)
- ELLISON, DONALD C. A Determination of Relativistic Shock Jump Conditions Using Monte Carlo Techniques. *Donald C. Ellison & Stephen P. Reynolds.* 378, 214, 153-F1 (1991)
- Electron Acceleration in a Nonlinear Shock Model with Applications to Supernova Remnants. *Donald C. Ellison & Stephen P. Reynolds.* 382, 242, 203-C1 (1991)
- ELLSWORTH, R. W. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- ELMEGREEN, BRUCE G. Cloud Formation by Combined Instabilities in Galactic Gas Layers: Evidence for a  $Q$  Threshold in the Fragmentation of Shearing Wavelets. *Bruce G. Elmegreen.* 378, 139, 152-F11 (1991)
- ELSON, REBECCA A. W. The Structure and Evolution of Rich Star Clusters in the Large Magellanic Cloud. *Rebecca A. W. Elson.* 76, 185, 26-E9 (1991)
- ELSTON, RICHARD. Detection of Polarized Ultraviolet Emission from the High-Redshift Radio Galaxy 3C 265. *Buell T. Jannuzzi & Richard Elston.* 366, L69, 11-C5 (1991)
- Emission from the  $z = 2$  Damped Ly $\alpha$  Absorber toward Q1215+333. *Richard Elston, Jill Bechtold, James Lowenthal, & Marcia Rieke.* 373, L39, 97-B1 (1991)
- UBVRI* Photometry of Stars in the Fields of X-Ray Selected BL Lacertae Objects. *Paul S. Smith, Buell T. Jannuzzi, & Richard Elston.* 77, 67, 44-D1 (1991)
- ELVIS, M. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- ELVIS, MARTIN. Extended X-Ray Emission in Nearby Seyfert Galaxies. *Martin Elvis, C. Fassnacht, A. S. Wilson, & U. Briel.* 371, 820, 71-F12 (1991) (Orig. paper in 361, 459, 163-G1 (1990))
- Persistence and Change in the Soft X-Ray Spectrum of the Quasar PG 1211+143. *Martin Elvis, P. Giommi, Belinda J. Wilkes, & Jonathan McDowell.* 378, 537, 159-B1 (1991)
- ELVIUS, A. The Ultraviolet Spectrum of NGC 4151 from 1978 to 1990: General Characteristics and Evolution. *M.-H. Ulrich, A. Bokkenberg, G. E. Bromage, J. Clavel, A. Elvius, M. V. Penston, G. C. Perola, & M. A. J. Snijders.* 382, 483, 207-E7 (1991)
- EMANUELSEN, P.-I. See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- EMSLIE, A. GORDON. Magnetohydrodynamics of an Impulsively Heated, Hard X-Ray Emitting Filament. *George Roumeliotis & A. Gordon Emslie.* 377, 685, 148-B9 (1991)
- ENCRENNAZ, P. See WANNIER, P. G., et al. Water in Dense Molecular Clouds.
- ENCRENNAZ, P. J. Detection of Interstellar  $H_3O^+$ : A Confirming Line. *Abwyn Wootten, J. G. Mangum, B. E. Turner, M. Bogey, F. Boulanger, F. Combes, P. J. Encrennaz, & M. Gerin.* 380, L79, 188-E6 (1991)
- ENDAL, A. S. Rotational Modulation in IUE Spectra of Cool Dwarf Chromospheres. I. Data Analysis and Period Search Techniques. *K. L. Hallam, B. Alten, & A. S. Endal.* 372, 610, 83-C1 (1991)
- ENDO, YASUKI. Laboratory Detection of  $HC_9N$  Using a Fourier Transform Microwave Spectrometer. *Minoru Iida, Yasuhiro Ohshima, & Yasuki Endo.* 371, L45, 66-F7 (1991)
- ENGARGIOLA, G. Origins of the 12–200 Micron Flux in NGC 6946: Starlight and Continuum Dust Emission from an Sc Galaxy. *G. Engargiola.* 76, 875, 36-G5 (1991)
- ENGEL, LISA. Nitrogen Abundance in Comet Halley. *Susan Wyckoff, Stephen C. Tegler, & Lisa Engel.* 367, 641, 21-C1 (1991)
- Ammonia Abundances in Four Comets. *Susan Wyckoff, Stephen C. Tegler, & Lisa Engel.* 368, 279, 26-E5 (1991)
- EPIFANI, M. High-Latitude Galactic Emission and the Search for Anisotropies of the Cosmic Background Radiation. *S. Masi, P. de Bernardis, M. De Petris, M. Epifani, M. Gervasi, & G. Guarini.* 366, L51, 11-B1 (1991)
- EPPLER, R. E., JR. See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a 7° Beam by the *Cosmic Background Explorer* (COBE).
- EPSTEIN, RICHARD I. Mechanics and Energetics of Vortex Unpinning in Neutron Stars. *Bennett K. Link & Richard I. Epstein.* 373, 592, 95-C11 (1991)
- Soft X-Ray Pulses from Neutron Star Glitches. *Kenneth A. Van Riper, Richard I. Epstein, & Guy S. Miller.* 381, L47, 199-C1 (1991)
- ERACLEOUS, MICHAEL. A Search for Periodicities in the X-Ray Emission from Cataclysmic Variables. *Michael Eracleous, Joseph Patterson, & Jules Halpern.* 370, 330, 51-D1 (1991)
- X-Ray Spectra of Cataclysmic Variables from the *Einstein Observatory*. *Michael Eracleous, Jules Halpern, & Joseph Patterson.* 382, 290, 203-G1 (1991)
- ERICKSON, E. F. Axisymmetric Model of the Ionized Gas in the Orion Nebula. *R. H. Rubin, J. P. Simpson, M. R. Haas, & E. F. Erickson.* 374, 564, 106-B12 (1991)
- ERICKSON, EDWIN F. Far-Infrared Line and Continuum Observations of G0.095+0.012 and the E2 Thermal Radio Filament near the Galactic Center. *Edwin F. Erickson, Sean W. J. Colgan, J. P. Simpson, Robert H. Rubin, Mark Morris, & Michael R. Haas.* 370, L69, 59-C1 (1991)
- Observations of [Si II] (35 Micron) and [S I] (25 Micron) in Orion: Evidence for a Wind Shock near IRC2. *Michael R. Haas, David Hollenbach, & Edwin F. Erickson.* 374, 555, 106-B1 (1991)
- ERKENS, U. See QUIRRENBACH, A., et al. Correlated Radio and Optical Variability in the BL Lacertae Object 0716+714.
- ERWIN, PETER. Near-Infrared Spectroscopy of the Planetary Nebula NGC 6572. *Richard J. Rudy, George S. Rossano, Peter Erwin, & R. C. Puettner.* 368, 468, 30-G13 (1991)
- The 0.46–1.3 Micron Spectrum of the Planetary Nebula BD +30°3639. *Richard J. Rudy, Ross D. Cohen, George S. Rossano, Peter Erwin, R. C. Puettner, & David K. Lynch.* 380, 151, 178-A1 (1991)
- Near-Infrared [Fe II] Emission of M82 Supernova Remnants: Implications for Tracing the Supernova Content of Galaxies. *Matthew A. Greenhouse, Charles E. Woodward, Harley A. Thronson,*

- Jr., Richard J. Rudy, George S. Rossano, Peter Erwin, & R. C. Puett. 383, 164, 214-B1 (1991)
- The 1.0–1.3 Micron Spectrum of LkHα 101. Richard J. Rudy, Peter Erwin, George S. Rossano, & R. C. Puett. 383, 344, 216-D7 (1991)
- ESCALANTE, V. Near-Infrared Emission of Neutral Carbon from Photon-dominated Regions. V. Escalante, A. Sternberg, & A. Dalgarno. 375, 630, 120-E1 (1991)
- ESCALANTE, VLADIMIR. Nitrogen Recombination Lines and Abundance in Nova Shells. Vladimir Escalante & Alexander Dalgarno. 369, 213, 38-E7 (1991)
- ESHE, P. M. See KRISHNER, T. P., et al. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of Voyager 2.
- ESKRIDGE, PAUL. A COSMOS Study of the Structure and Content of NGC 6822. Paul Hodge, Toby Smith, Paul Eskridge, Harvey MacGillivray, & Steven Beard. 379, 621, 172-D1 (1991)
- ESKRIDGE, PAUL B. A Cosmos Study of IC 1613. Paul W. Hodge, Toby R. Smith, Paul B. Eskridge, Harvey T. MacGillivray, & Steven M. Beard. 369, 372, 42-D5 (1991)
- ESMAILZADEH, RAHIM. Primordial Nucleosynthesis without a Computer. Rahim Esmailzadeh, Glenn D. Starkman, & Savas Dimopoulos. 378, 504, 158-F7 (1991)
- ESPEY, B. R. See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- ESTALELLA, R. Multifrequency VLA Observations of Radio Continuum from IRAS 16293–2422. R. Estalella, G. Anglada, L. F. Rodriguez, & G. Garay. 371, 626, 69-C12 (1991)
- ESTALELLA, ROBERT. A Double Radio Source at the Center of the Outflow in L723. Guillem Anglada, Robert Estalella, Luis F. Rodriguez, José M. Torrelles, Rosario López, & Jorge Cantó. 376, 615, 134-A7 (1991)
- EVANS, DAVID J. The Sensitivity of Chromospherically Induced *p*- and *f*-Mode Frequency Shifts to the Height of the Magnetic Canopy. David J. Evans & B. Roberts. 371, 387, 64-G9 (1991)
- EVANS, I. N. HST Imaging of the Inner 3 Arcseconds of NGC 1068 in the Light of [O III] λ5007. I. N. Evans, H. C. Ford, A. L. Kinney, R. R. J. Antonucci, L. Armus, & S. Caganoff. 369, L27, 45-C9 (1991)
- Theoretical H II Region Models: The Effects of Stellar Atmosphere Models. I. N. Evans. 76, 985, 38-E13 (1991)
- See CAGANOFF, S., et al. Faint Object Spectrograph Spectroscopy of Resolved Structure in the Nucleus of NGC 1068.
- EVANS, NANCY REMAGE. Classical Cepheid Luminosities from Binary Companions. Nancy Remage Evans. 372, 597, 83-B1 (1991)
- EVANS, NEAL J., II. A 2.2 Micron Survey in the L1630 Molecular Cloud. Elizabeth A. Lada, D. L. DePoy, Neal J. Evans II, & Ian Galley. 371, 171, 62-C1 (1991)
- CS Multitranstional Studies of Density Distribution in Star-forming Regions. I. The NGC 2071 Region. Shudong Zhou, Neal J. Evans II, Rolf Güsten, Lee G. Mundy, & Marc L. Kutner. 372, 518, 82-C1 (1991)
- Discovery of Interstellar Methane: Observations of Gaseous and Solid CH<sub>4</sub> Absorption toward Young Stars in Molecular Clouds. J. H. Lacy, J. S. Carr, Neal J. Evans II, F. Baas, J. M. Achtermann, & J. F. Arens. 376, 556, 133-C9 (1991)
- Testing Models of Low-Mass Star Formation: High-Resolution Far-Infrared Observations of L1551 IRS 5. Harold M. Butner, Neal J. Evans II, Daniel F. Lester, Russell M. Levereault, & Stephen E. Strom. 376, 636, 134-C6 (1991)
- Infrared Molecular Spectroscopy toward the Orion IRC2 and IRC7 Sources: A New Probe of Physical Conditions and Abundances in Molecular Clouds. Neal J. Evans II, J. H. Lacy, & John S. Carr. 383, 674, 222-E13 (1991)
- EVENSON, KENNETH M. Atomic Oxygen Fine-Structure Splittings with Tunable Far-Infrared Spectroscopy. Lyndon R. Zink, Kenneth M. Evenson, Fusakazu Matsushima, Thomas Nelis, & Ruth L. Robinson. 371, L85, 73-E3 (1991)
- EVENSON, PAUL. Solar Modulation of Cosmic Electrons: Evidence for Dynamic Regulation. Evelyn Tuska, Paul Evenson, & Peter Meyer. 373, L27, 91-D1 (1991)
- EVWARD, A. E. Expectations for X-Ray Cluster Observations by the ROSAT Satellite. A. E. Evward & J. P. Henry. 383, 95, 213-C1 (1991)
- EWALD, S. P. See LYNDS, ROGER, et al. NGC 1068: Resolution of Nuclear Structure in the Optical Continuum.
- See HOLTZMAN, JON A., et al. Stellar Photometry with the *Hubble Space Telescope* Wide-Field/Planetary Camera: A Progress Report.
- See LAUER, TOD R., et al. The Core of the Nearby S0 Galaxy NGC 7457 Imaged with the *HST* Planetary Camera.
- See LAUER, TOD R., et al. The Postcollapse Core of M15 Imaged with the *HST* Planetary Camera.
- See WESTPHAL, JAMES A., et al. *Hubble Space Telescope* Wide-Field/Planetary Camera Images of Saturn.
- See HESTER, J. JEFF, et al. Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0''.1.
- EWING, J. A. Evidence for a 250 Second Brightness Oscillation at 1600 Å in the Solar Temperature Minimum Region. J. W. Cook & J. A. Ewing. 371, 804, 71-E5 (1991)
- EYLES, C. J. The Distribution of Dark Matter in the Perseus Cluster. C. J. Eyles, M. P. Watt, D. Bertram, M. J. Church, T. J. Ponman, G. K. Skinner, & A. P. Willmore. 376, 23, 125-C12 (1991)
- FABBIANO, G. The Discrete X-Ray Source Population in M31. G. Trinchieri & G. Fabbiano. 382, 82, 201-B6 (1991)
- FABER, S. M. New Velocity Dispersions and Photometry for E and S0 Galaxies in the Great Attractor. Alan Dressler, S. M. Faber, & David Burstein. 368, 54, 23-G1 (1991)
- The Imaging Performance of the *Hubble Space Telescope*. Christopher J. Burrows, Jon A. Holtzman, S. M. Faber, Pierre Y. Bely, Hashima Hasan, C. R. Lynds, & Daniel Schroeder. 369, L21, 45-C1 (1991)
- See LYNDS, ROGER, et al. NGC 1068: Resolution of Nuclear Structure in the Optical Continuum.
- See HOLTZMAN, JON A., et al. Stellar Photometry with the *Hubble Space Telescope* Wide-Field/Planetary Camera: A Progress Report.
- See LAUER, TOD R., et al. The Core of the Nearby S0 Galaxy NGC 7457 Imaged with the *HST* Planetary Camera.
- See LAUER, TOD R., et al. The Postcollapse Core of M15 Imaged with the *HST* Planetary Camera.
- See WESTPHAL, JAMES A., et al. *Hubble Space Telescope* Wide-Field/Planetary Camera Images of Saturn.
- See HESTER, J. JEFF, et al. Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0''.1.
- Galaxy Velocity Dispersions Using a Cross-Correlation Method: Erratum. Cristina Dalle Ore, S. M. Faber, J. Jesús González, Roland Stoughton, & David Burstein. 375, 427, 116-B12 (1991) (Orig. paper in 366, 38, 1-E5 (1991))
- FABIAN, A. C. Ram-Pressure Stripping of the Multiphase Interstellar Medium of the Virgo Cluster Elliptical Galaxy M86 (NGC 4406). David A. White, A. C. Fabian, W. Forman, C. Jones, & C. Stern. 375, 35, 111-D9 (1991)
- FABRICANT, DANIEL G. Galaxy Evolution in Distant, X-Ray-Selected Clusters of Galaxies. I. Cl 1358+6245. Daniel G. Fabricant, Jeffrey E. McClintock, & Marshall W. Bautz. 381, 33, 189-D8 (1991)
- FAGUNDES, H. V. Numerical Study of a Perturbed Einstein-de Sitter Cosmological Model. H. V. Fagundes & S. F. Kwok. 368, 337, 29-C4 (1991)
- FAHEY, R. P. C IV Line Profile Correlations in NGC 4151. R. P. Fahey, A. G. Michalitsianos, & D. Kazanas. 371, 136, 61-F9 (1991)
- FAHLMAN, GREGORY G. Multicomponent Models for the Dynamic Evolution of Globular Clusters. Hyung Mok Lee, Gregory G. Fahrlman, & Harvey B. Richer. 366, 455, 8-E1 (1991)
- The Stellar Content and Structure of the Globular Cluster NGC 5053. Gregory G. Fahrlman, Harvey B. Richer, & James Nemec. 380, 124, 177-E11 (1991)
- Globular Cluster Mass Functions. Harvey B. Richer, Gregory G. Fahrlman, Roberto Buonanno, Flavio Fusi Pecci, Leonard Searle, & Ian B. Thompson. 381, 147, 190-G7 (1991)
- FAHR, H. J. Three-dimensional Models of a Galactic Wind Expansion with Ellipsoidal Geometry. I. The Hydrodynamical Test Case. H. Fichtner, W. Neutsch, H. J. Fahr, & R. Schlickeiser. 371, 98, 61-C9 (1991)
- FARHEAD, L. A Spectral Study of Four Millisecond Pulsars. R. S. Foster, L. Fairhead, & D. C. Backer. 378, 687, 161-A1 (1991)

- FALCO, E. E. New Model for the 0957+561 Gravitational Lens System: Bounds on Masses of a Possible Black Hole and Dark Matter and Prospects for Estimation of  $H_0$ . *E. E. Falco, M. V. Gorenstein, & J. I. Shapiro*. 372, 364, 80-D1 (1991)
- FALGARONE, E. The Edges of Molecular Clouds: Fractal Boundaries and Density Structure. *E. Falgarone, T. G. Phillips, & C. K. Walker*. 378, 186, 153-C8 (1991)
- FALK, TOBY. Gravitational Lens Interference. *J. B. Peterson & Toby Falk*. 374, L5, 103-C1 (1991)
- FALL, S. MICHAEL. Confirmation of Dust in Damped Lyman-Alpha Systems. *Yichuan C. Pei, S. Michael Fall, & Jill Bechtold*. 378, 6, 151-B4 (1991)
- Attenuation of Lyman-Alpha Emission by Dust in Damped Lyman-Alpha Systems. *Stéphane Charlot & S. Michael Fall*. 378, 471, 158-C7 (1991)
- FALOMO, R. Coordinated X-Ray, Ultraviolet, and Optical Observations of 3C 120. *L. Maraschi, L. Chiappetti, R. Falomo, B. Garilli, M. Malkan, G. Tagliaferri, E. G. Tanzi, & A. Treves*. 368, 138, 24-F9 (1991)
- On the Nebulosity Surrounding the BL Lacertae Object PKS 2155-304. *R. Falomo, E. Giraud, L. Maraschi, J. Melnick, E. G. Tanzi, & A. Treves*. 380, L67, 188-D1 (1991)
- FARNHAM, TONY. OX 169: Evidence for a Recent Merger. *Alan Stockton & Tony Farnham*. 371, 525, 68-A13 (1991)
- FASSNACHT, C. Extended X-Ray Emission in Nearby Seyfert Galaxies. *Martin Elvis, C. Fassnacht, A. S. Wilson, & U. Briel*. 371, 820, 71-F12 (1991) (Orig. paper in 361, 459, 163-G1 (1990))
- FATUZZO, MARCO. Transverse Conductivity of a Relativistic Plasma in Oblique Electric and Magnetic Fields. *Fulvio Melia & Marco Fatuzzo*. 373, 198, 88-D8 (1991)
- Transient Particle Acceleration in Strongly Magnetized Neutron Stars. *Fulvio Melia & Marco Fatuzzo*. 376, 673, 134-F7 (1991)
- Transient Particle Acceleration in Strongly Magnetized Neutron Stars. II. Effects Due to a Dipole Field Geometry. *Marco Fatuzzo & Fulvio Melia*. 382, 570, 208-E10 (1991)
- Gamma-Ray Bursts from Sheared Alfvén Waves. *Fulvio Melia & Marco Fatuzzo*. 383, L57, 226-D1 (1991)
- FAUCHER, P. The O VII Soft X-Ray Spectrum and Its Application to Hot Plasmas in Astrophysics. *A. H. Gabriel, F. Bely-Dubau, P. Faucher, & L. W. Acton*. 378, 438, 156-D1 (1991)
- FAULKNER, D. J. Observation of Neutral Hydrogen in the Globular Cluster NGC 2808. *D. J. Faulkner, Tania R. Scott, P. R. Wood, & Alan E. Wright*. 374, L45, 110-C6 (1991)
- Interaction of Mass Lost in Globular Clusters with the Halo Medium. *D. J. Faulkner & Graeme H. Smith*. 380, 441, 183-F7 (1991)
- FAWCETT, B. C. Accurate Oscillator Strengths of Astrophysical Interest for Neutral Oxygen. *E. Blémont, A. Hibbert, M. Godefroid, N. Vaeck, & B. C. Fawcett*. 375, 818, 122-G1 (1991)
- FAZIO, G. Galactic Structure from the Spacelab Infrared Telescope. II. Luminosity Models of the Milky Way. *S. M. Kent, T. M. Dame, & G. Fazio*. 378, 131, 152-F1 (1991)
- FEDERMAN, S. R. Formaldehyde in Envelopes of Interstellar Dark Clouds. *S. R. Federman & M. Allen*. 375, 157, 113-A1 (1991)
- Interstellar Environments Probed by Ca I Absorption and the Effects of Density-dependent Depletions. *Jason A. Cardelli, S. R. Federman, & V. V. Smith*. 381, L17, 194-C7 (1991)
- FEGAN, D. J. See MACOMB, D. J., et al. Search for TeV Emission from 4U 0115+63.
- See VACANTI, G., et al. Gamma-Ray Observations of the Crab Nebula at TeV Energies.
- See AKERLOF, C. W., et al. Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy.
- See REYNOLDS, P. T., et al. Search for TeV Gamma-Ray Emission from Hercules X-1.
- FEIBELMAN, WALTER A. Ultraviolet High-Excitation Fe II Fluorescence Lines Excited by O VI, C IV, and H I Resonance Emission As Seen in IUE Spectra. *Walter A. Feibelman, Frederick C. Bruhwiler, & Sveneric Johansson*. 373, 649, 96-A8 (1991)
- The Ultraviolet Spectrum of KX Trianguli Australis. *Walter A. Feibelman*. 375, 335, 115-A12 (1991)
- Ultraviolet Fe VII Absorption and Fe II Emission Lines of Central Stars of Planetary Nebulae. *Kwang-Ping Cheng, Walter A. Feibelman, & Frederick C. Bruhwiler*. 377, 235, 140-G7 (1991)
- FEIGELSON, E. D. Millarcsecond Radio Structure of Weak-lined T Tauri Stars. *R. B. Phillips, C. J. Lonsdale, & E. D. Feigelson*. 382, 261, 203-D9 (1991)
- FEIGELSON, ERIC D. A Rich Cluster of Radio Stars in the  $\rho$  Ophiuchi Cloud Cores. *James A. Leous, Eric D. Feigelson, Philippe André, & Thierry Montmerle*. 379, 683, 173-B10 (1991)
- FELDMAN, P. A. Detection of  $^{13}\text{C}$  Isotopomers of  $\text{HC}_5\text{N}$  ( $J = 9-8$ ) in the Circumstellar Envelope of IRC +10216. *M. B. Bell & P. A. Feldman*. 367, L33, 17-E8 (1991)
- FELDMAN, P. D. Observations of Comet Levy (1990c) with the Hopkins Ultraviolet Telescope. *P. D. Feldman, A. F. Davidsen, W. P. Blair, C. W. Bowers, W. V. Dixon, S. T. Durrance, H. C. Ferguson, R. C. Henry, R. A. Kimble, G. A. Kriss, J. W. Kruk, K. S. Long, H. W. Moos, O. Vancura, & T. R. Gull*. 379, L37, 169-D7 (1991)
- See MOOS, H. W., et al. Determination of Ionic Abundances in the Io Torus Using the Hopkins Ultraviolet Telescope.
- FELDMAN, PAUL D. See BLAIR, WILLIAM P., et al. Discovery of a Fast Radiative Shock Wave in the Cygnus Loop Using the Hopkins Ultraviolet Telescope.
- See LONG, KNOX S., et al. Spectroscopy of Z Camelopardalis in Outburst with the Hopkins Ultraviolet Telescope.
- See FERGUSON, HENRY C., et al. Constraints on the Origin of the Ultraviolet Upturn in Elliptical Galaxies from Hopkins Ultraviolet Telescope Observations of NGC 1399.
- FELDMAN, U. The Solar Spectrum between 914 and 1177 Å. *U. Feldman & G. A. Doschek*. 75, 925, 14-B13 (1991)
- Analysis of the Solar O II/O III Multiplets at 834 Å: Implications for the Emission Measure Distribution in the Vicinity of 40,000 K. *R. R. Meier, K. G. Widing, & U. Feldman*. 369, 570, 44-G7 (1991)
- The Iron-to-Calcium Abundance Ratio in the  $20 \times 10^6$  K Plasma of Medium and Large Solar Flares. *K. J. H. Phillips & U. Feldman*. 379, 401, 168-A5 (1991)
- FEMINELLA, F. Spatial Distribution of the Interplanetary Dust Deduced by Infrared Observations. *P. de Bernardis, F. Feminella, & G. Moreno*. 370, 396, 52-B10 (1991)
- FENCL, H. S. Photoerosion and the Abundances of  $^7\text{Li}$ ,  $^9\text{Be}$ ,  $^{10}\text{B}$ , and  $^{11}\text{B}$  near Active Galactic Nuclei. *R. N. Boyd & H. S. Fencl*. 373, 84, 87-A13 (1991)
- FENIMORE, E. E.  $V/V_{\max}$  Test Applied to Ginga Gamma-Ray Bursts. *Y. Ogasaka, T. Murakami, J. Nishimura, A. Yoshida, & E. E. Fenimore*. 383, L61, 226-D6 (1991)
- FERNANDEZ, A. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- FERGUSON, H. C. See FELDMAN, P. D., et al. Observations of Comet Levy (1990c) with the Hopkins Ultraviolet Telescope.
- See MOOS, H. W., et al. Determination of Ionic Abundances in the Io Torus Using the Hopkins Ultraviolet Telescope.
- FERGUSON, HENRY C. See BLAIR, WILLIAM P., et al. Discovery of a Fast Radiative Shock Wave in the Cygnus Loop Using the Hopkins Ultraviolet Telescope.
- See LONG, KNOX S., et al. Spectroscopy of Z Camelopardalis in Outburst with the Hopkins Ultraviolet Telescope.
- Constraints on the Origin of the Ultraviolet Upturn in Elliptical Galaxies from Hopkins Ultraviolet Telescope Observations of NGC 1399. *Henry C. Ferguson, Arthur F. Davidsen, Gerard A. Kriss, William P. Blair, Charles W. Bowers, W. Van Dyke Dixon, Samuel T. Durrance, Paul D. Feldman, Richard C. Henry, Jeffrey W. Kruk, H. Warren Moos, Olaf Vancura, Knox S. Long, & Randy A. Kimble*. 382, L69, 211-C1 (1991)
- See LANE, N. J. NGC 6302: Ionized by a Very Hot Star or by a Wind? *N. J. Lane & G. J. Ferland*. 367, 208, 14-F1 (1991)
- FERLAND, GARY J. See SAIZAR, PEDRO, et al. PW Vulpeculae: A Nova with Nearly Solar Abundances.
- Physical Conditions in the Orion Nebula and an Assessment of Its Helium Abundance. *Jack A. Baldwin, Gary J. Ferland, P. G. Martin, Michael R. Corbin, Stephen A. Cota, Bradley M. Peterson, & Arne Slettebak*. 374, 580, 106-D1 (1991)

- FERLET, R. Variable Interstellar Absorption toward HD 72127A. II. 1981–1988. *L. M. Hobbs, R. Ferlet, D. E. Welty, & G. Wallerstein.* 378, 586, 159–F1 (1991)
- FERNINI, ILIAS. Depolarization Asymmetry in the Quasar 3C 47. *Ilias Fernini, J. Patrick Leahy, Jack O. Burns, & John P. Basart.* 381, 63, 189–G1 (1991)
- FERRARA, A. Hydrodynamics of the Hot Component of the Galactic Halo. I. Steady State Solutions. *G. Einaudi & A. Ferrara.* 371, 571, 68–E12 (1991)
- Evolution of Dust Grains through a Hot Gaseous Halo. *A. Ferrara, F. Ferrini, J. Franco, & B. Barsella.* 381, 137, 190–F9 (1991)
- FERRARA, ANDREA. Photolevitation of Diffuse Clouds. *José Franco, Federico Ferrini, Andrea Ferrara, & Bruno Barsella.* 366, 443, 8–D1 (1991)
- FERRARI, A. The Finite-Amplitude Behavior of the Joule Mode under Astrophysical Conditions. *G. Bodo, S. Massaglia, R. Rosner, & A. Ferrari.* 370, 398, 52–C1 (1991)
- FERRIÈRE, KATIA M. Expansion of a Superbubble in a Uniform Magnetic Field. *Katia M. Ferrière, Mordecai-Mark Mac Low, & Ellen G. Zweibel.* 375, 239, 114–A4 (1991)
- Magnetized Supernova Remnants with Cosmic Rays. *Katia M. Ferrière & Ellen G. Zweibel.* 383, 602, 221–F11 (1991)
- FERRINI, F. Evolution of Dust Grains through a Hot Gaseous Halo. *A. Ferrara, F. Ferrini, J. Franco, & B. Barsella.* 381, 137, 190–F9 (1991)
- FERRINI, FEDERICO. Photolevitation of Diffuse Clouds. *José Franco, Federico Ferrini, Andrea Ferrara, & Bruno Barsella.* 366, 443, 8–D1 (1991)
- FESEN, ROBERT A. New Clues to the Cassiopeia A Supernova Progenitor. *Robert A. Fesen & Robert H. Becker.* 371, 621, 69–C4 (1991)
- FEY, A. L. VLA and VLBI Angular Broadening Measurements: The Distribution of Interstellar Scattering at Low Galactic Latitudes. *A. L. Fey, S. R. Spangler, & J. M. Cordes.* 372, 132, 75–F1 (1991)
- FICH, MICHEL. Continuum Emission at 1 Millimeter from the Elliptical Galaxy NGC 205. *Michel Fich & Paul Hodge.* 374, L17, 103–D7 (1991)
- FICHTEL, CARL E. Cosmic-Ray Distribution and the Dynamic Balance in the Large Magellanic Cloud. *Carl E. Fichtel, Mehmet E. Özsel, Robert G. Stone, & P. Sreekumar.* 374, 134, 99–F7 (1991)
- FICHTNER, H. Three-dimensional Models of a Galactic Wind Expansion with Ellipsoidal Geometry. I. The Hydrodynamical Test Case. *H. Fichtner, W. Neutsch, H. J. Fahr, & R. Schlickeiser.* 371, 98, 61–C9 (1991)
- FICK, B. E. See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- FIEDLER, R. L. Daily Observations of Compact Radio Sources at 2.7 and 8.1 GHz: 1979–1987. *E. B. Waltman, R. L. Fiedler, K. J. Johnston, J. H. Spencer, D. R. Florkowski, F. J. Josties, D. D. McCarthy, & D. N. Matsakis.* 77, 379, 49–G5 (1991)
- FIELD, G. B. Compton Reflection in Active Galactic Nuclei and the Cosmic X-Ray Background. *R. D. Rogers & G. B. Field.* 370, L57, 59–A11 (1991)
- A Compton Reflection Model for the Cosmic X-Ray and Gamma-Ray Backgrounds. *R. D. Rogers & G. B. Field.* 378, L17, 157–C1 (1991)
- FILHO, CÉSAR MEIRELLES. Turbulence, Convection, and Stability in Accretion Disks. *César Meirelles Filho.* 378, 266, 154–C4 (1991)
- FILIPPENKO, A. V. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- FILIPPENKO, ALEXEI V. Premaximum Observations of the Type Ia SN 1990N. *Bruno Leibundgut, Robert P. Kirshner, Alexei V. Filippenko, Joseph C. Shields, Craig B. Foltz, Mark M. Phillips, & George Sonneborn.* 371, L23, 66–D1 (1991)
- The Ultraviolet Spectrum and Continuum Energy Distribution of the Bright Quasar H1821+643. *Michiel Kolman, Jules P. Halpern, Chris R. Shrader, & Alexei V. Filippenko.* 373, 57, 86–F8 (1991)
- Bowen Fluorescence in AM Herculis Stars. *Jonathan Schachter, Alexei V. Filippenko, Steven M. Kahn, & Frits B. S. Paerels.* 373, 633, 95–G4 (1991)
- The Near-Maximum-Light Spectrum of the Type Ic Supernova 1987M. *David J. Jeffery, David Branch, Alexei V. Filippenko, & Ken’ichi Nomoto.* 377, L89, 150–D10 (1991)
- FINK, U. The Structure of Io’s Corona. *N. M. Schneider, D. M. Hunten, W. K. Wells, A. B. Schultz, & U. Fink.* 368, 298, 27–G1 (1991)
- FINK, UWE. Comet P/Halley: Spatial Distributions and Scale Lengths for C<sub>2</sub>, CN, NH<sub>3</sub>, and H<sub>2</sub>O. *Uwe Fink, Michael R. Combi, & Michael A. DiSanctis.* 383, 356, 216–F9 (1991)
- FINN, JOHN M. Three-dimensional Kinematic Reconnection of Plasmoids. *Yun-Tung Lau & John M. Finn.* 366, 577, 10–B11 (1991)
- FISCHER, JACQUELINE. Infrared Recombination Lines of Hydrogen from Young Objects in the Southern Galactic Plane. *Sara C. Beck, Jacqueline Fischer, & Howard A. Smith.* 383, 336, 216–D1 (1991)
- FISHER, GEORGE H. The Stretching of Magnetic Flux Tubes in the Convective Overshoot Region. *George H. Fisher, Alexander N. McClymont, & Dean-Yi Chou.* 374, 766, 108–E10 (1991)
- FITCHET, MICHAEL J. Dynamics of the Microwave-Decrement Cluster Abel 665. *William R. Oegerle, Michael J. Fitchett, John M. Hill, & Paul Hintzen.* 376, 46, 125–E10 (1991)
- FITZPATRICK, EDWARD L. DD 13: A Very Young and Heavily Reddened Early O Star in the Large Magellanic Cloud. *Peter S. Conti & Edward L. Fitzpatrick.* 373, 100, 87–C5 (1991)
- FITZURKA, MICHELLE A. A Large Supershell H II Region Complex in the Large Magellanic Cloud and the Interstellar Environment of SN 1987A. *Frederick C. Bruhweiler, Michelle A. Fitzurka, & Theodore R. Gull.* 370, 551, 55–C9 (1991)
- FIX, JOHN D. Axisymmetric Models of Circumstellar Dust Shells. *Alan J. Collison & John D. Fix.* 368, 545, 31–G7 (1991)
- Circular Polarization in 1612 MHz OH Maser Emission from OH/IR Stars. *Philip J. Zell & John D. Fix.* 369, 506, 44–A9 (1991)
- FIXSEN, D. J. See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a 7° Beam by the *Cosmic Background Explorer* (COBE).
- FLAGAN, RICHARD C. Ablation of Silicate Particles in High-Speed Continuum and Transition Flow with Application to the Collection of Interplanetary Dust Particles. *Aaron J. Rulison, Richard C. Flagan, Thomas J. Ahrens, & Wayne F. Miller.* 371, 432, 65–E5 (1991)
- FLEES, D. J. First Interferometric Observations of Solar Microwave Millisecond Spike Bursts. *Dale E. Gary, G. J. Hurford, & D. J. Flees.* 369, 255, 39–B1 (1991)
- FLEMING, THOMAS A. The *Einstein Observatory Extended Medium-Sensitivity Survey*. II. The Optical Identifications. *John T. Stocke, Simon L. Morris, I. M. Gioia, T. Maccacaro, R. Schild, A. Wolter, Thomas A. Fleming, & J. Patrick Henry.* 76, 813, 36–B1 (1991)
- Digging in the Coronal Graveyard: A ROSAT Observation of the Red Giant Arcturus. *Thomas R. Ayres, Thomas A. Fleming, & Juergen H. M. M. Schmitt.* 376, L45, 137–C7 (1991)
- FLETCHER, J. MURRAY. Metallic Line Profiles of the A0 V Star Vega. *Austin F. Gulliver, Saul J. Adelman, Charles R. Cowley, & J. Murray Fletcher.* 380, 223, 178–G1 (1991)
- FLICKINGER, GREGORY C. On the State of the Emitter of the 3.3 Micron Unidentified Infrared Band: Absorption Spectroscopy of Polycyclic Aromatic Hydrocarbon Species. *Gregory C. Flickinger, Thomas J. Wdowiak, & Percy L. Gómez.* 380, L43, 181–F1 (1991)
- FLORKOWSKI, D. R. Daily Observations of Compact Radio Sources at 2.7 and 8.1 GHz: 1979–1987. *E. B. Waltman, R. L. Fiedler, K. J. Johnston, J. H. Spencer, D. R. Florkowski, F. J. Josties, D. D. McCarthy, & D. N. Matsakis.* 77, 379, 49–G5 (1991)
- FOLTZ, CRAIG B. Premaximum Observations of the Type Ia SN 1990N. *Bruno Leibundgut, Robert P. Kirshner, Alexei V. Filippenko, Joseph C. Shields, Craig B. Foltz, Mark M. Phillips, & George Sonneborn.* 371, L23, 66–D1 (1991)
- Comparisons of the Emission-Line and Continuum Properties of Broad Absorption Line and Normal Quasi-stellar Objects. *Ray J. Weymann, Simon L. Morris, Craig B. Foltz, & Paul C. Hewett.* 373, 23, 86–C13 (1991)
- A High Signal-to-Noise Ratio Composite Quasar Spectrum. *Paul J. Francis, Paul C. Hewett, Craig B. Foltz, Frederic H. Chaffee, Ray J. Weymann, & Simon L. Morris.* 373, 465, 93–F10 (1991)
- Discovery of a Lyα Galaxy near a Damped Lyα Absorber at z = 2.3. *James D. Lowenthal, Craig J. Hogan, Richard F. Green, Adeline*

- Caulet, Bruce E. Woodgate, Larry Brown, & Craig B. Foltz.* 377, L73, 150-C1 (1991)
- FOMALONT, E. B. The Proper Motion of the Soft X-Ray-emitting Radio Pulsar PSR 0656+14. *R. J. Thompson, Jr., F. A. Cerdova, R. M. Hjellming, & E. B. Fomalont.* 366, L83, 11-E1 (1991)
- The Radio "Lobes" of Scorpius X-1 Are Unrelated Background Sources. *E. B. Fomalont & B. J. Geldzahler.* 383, 289, 215-G1 (1991)
- FOMALONT, EDWARD B. A Finger-like Extension of the 20 Kilometer per Second Cloud toward the Galactic Center. *Sachiko K. Okumura, Masato Ishiguro, Edward B. Fomalont, Tetsuo Hasegawa, Takashi Kasuga, Koh-Ichiro Morita, Ryohei Kawabe, & Hideyuki Kobayashi.* 378, 127, 152-E9 (1991)
- FONTAINE, G. Synthetic Spectra and Atmospheric Properties of Cool DA White Dwarfs. *P. Bergeron, F. Wesemael, & G. Fontaine.* 367, 253, 15-C1 (1991)
- Adiabatic Properties of Pulsating DA White Dwarfs. I. The Treatment of the Brunt-Väisälä Frequency and the Region of Period Formation. *P. Brassard, G. Fontaine, F. Wesemael, S. D. Kawaler, & M. Tassoul.* 367, 601, 20-F11 (1991)
- See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- Discovery and Seismological Interpretation of Low-Amplitude Modes in the Pulsating DO White Dwarf PG 1707+427 (V817 Herculis). *G. Fontaine, P. Bergeron, G. Vauclair, P. Brassard, F. Wesemael, S. D. Kawaler, A. D. Grauer, & D. E. Winget.* 378, L49, 162-F1 (1991)
- FONTÁN, C. FERRO. Analysis of Radiation Pressure Effects in Pulsating Stars through Perturbative Limit Cycle Solutions. *A. Costa, D. Gómez, & C. Ferro Fontán.* 373, 237, 88-G13 (1991)
- FONTENLA, J. Non-Maxwellian Electron Distributions in Models of the Solar Atmosphere. *P. MacNeice, J. Fontenla, & N. N. Ljepojevic.* 369, 544, 44-E1 (1991)
- FONTENLA, J. M. Energy Balance in the Solar Transition Region. II. Effects of Pressure and Energy Input on Hydrostatic Models. *J. M. Fontenla, E. H. Avrett, & R. Loeser.* 377, 712, 148-E1 (1991)
- FONTI, SERGIO. Hydrogenated Amorphous Carbon Grains and the 2175 Å Interstellar Hump. *Armando Blanco, Ezio Bussolati, Luigi Colangeli, Sergio Fonti, & John R. Stephens.* 382, L97, 211-E8 (1991)
- FORBES, DUNCAN A. Infrared Hot Spots in the Nucleus of NGC 253. *Duncan A. Forbes, Martin J. Ward, & D. L. DePoy.* 380, L63, 188-C6 (1991)
- FORBES, T. G. A Catastrophe Mechanism for Coronal Mass Ejections. *T. G. Forbes & P. A. Isenberg.* 373, 294, 89-F1 (1991)
- FORD, H. C. HST Imaging of the Inner 3 Arcseconds of NGC 1068 in the Light of [O III] λ5007. *I. N. Evans, H. C. Ford, A. L. Kinney, R. R. J. Antonucci, L. Armus, & S. Caganoff.* 369, L27, 45-C9 (1991)
- See CAGANOFF, S., et al. Faint Object Spectrograph Spectroscopy of Resolved Structure in the Nucleus of NGC 1068.
- FORD, W. KENT, JR. Optical Properties and Dynamics of Galaxies in the Hickson Compact Groups. *Vera C. Rubin, Deidre A. Hunter, & W. Kent Ford, Jr.* 76, 153, 26-A1 (1991)
- FORMAN, W. Evolution of the Interstellar Medium in Elliptical Galaxies. II. X-Ray Properties. *L. P. David, W. Forman, & C. Jones.* 369, 121, 37-D9 (1991)
- Ram-Pressure Stripping of the Multiphase Interstellar Medium of the Virgo Cluster Elliptical Galaxy M86 (NGC 4406). *David A. White, A. C. Fabian, W. Forman, C. Jones, & C. Stern.* 375, 35, 111-D9 (1991)
- Do Clusters of Galaxies Affect the Spectrum of the Microwave Background? *M. Markevitch, G. R. Blumenthal, W. Forman, C. Jones, & R. A. Sunyaev.* 378, L33, 162-D1 (1991)
- Enrichment and Heating of the Intracluster Medium through Galactic Winds. *L. P. David, W. Forman, & C. Jones.* 380, 39, 176-E1 (1991)
- FORMAN, WILLIAM R. Interstellar Matter in Early-Type Galaxies. I. The Catalog. *Morton S. Roberts, David E. Hogg, Joel N. Bregman, William R. Forman, & Christine Jones.* 75, 751, 11-F5 (1991)
- FORREST, D. J. Solar Gamma-Ray-Line Flares, Type II Radio Bursts, and Coronal Mass Ejections. *E. W. Cliver, H. V. Cane, D. J. Forrest, M. J. Koomen, R. A. Howard, & C. S. Wright.* 379, 741, 174-A2 (1991)
- FORREST, W. J. Infrared and Visible Photometry of the Gravitational Lens System 2237+030. *Daniel Nadeau, H. K. C. Yee, W. J. Forrest, J. D. Garnett, Z. Ninkov, & J. L. Pipher.* 376, 430, 131-G1 (1991)
- FORREST, WILLIAM. Spectroscopy of Taurus Cloud Brown Dwarf Candidates. *John Stauffer, Terry Herter, Donald Hamilton, George H. Rieke, Marcia J. Rieke, Ron Probst, & William Forrest.* 367, L23, 17-D7 (1991)
- FORT, BERNARD. Spectroscopy of the Gravitational Arcs in Cl 2244-02, A370 (Arclet A5), and Cl 0024+1654. *Yannick Mellier, Bernard Fort, Geneviève Soucail, Guy Mathez, & Mireille Caillous.* 380, 334, 182-D10 (1991)
- FOSS, DIANA. Limits on the Space Density of Double Degenerates as Type Ia Supernova Progenitors. *Diana Foss, Richard A. Wade, & Richard F. Green.* 374, 281, 101-E9 (1991)
- FOSTER, R. S. A Spectral Study of Four Millisecond Pulsars. *R. S. Foster, L. Fairhead, & D. C. Backer.* 378, 687, 161-A1 (1991)
- FOUKAL, P. Do Changes in the Photospheric Magnetic Network Cause the 11 Year Variation of Total Solar Irradiance? *P. Foukal, K. Harvey, & F. Hill.* 383, L89, 226-G1 (1991)
- FOWLER, WILLIAM A. Signatures of Inhomogeneity in the Early Universe. *Lawrence H. Kawano, William A. Fowler, Ralph W. Kavanagh, & Robert A. Malaney.* 372, 1, 74-A11 (1991)
- Our Sun. II. Early Mass Loss of  $0.1 M_{\odot}$  and the Case of the Missing Lithium. *Arnold I. Boothroyd, I. Juliana Sackmann, & William A. Fowler.* 377, 318, 141-G11 (1991)
- Signatures of Inhomogeneity in the Early Universe: Erratum. *Lawrence H. Kawano, William A. Fowler, Ralph W. Kavanagh, & Robert A. Malaney.* 382, 358, 204-E13 (1991) (Orig. paper in 372, 1, 74-A11 (1991))
- FOX, DAVID C. Multiple Scattering of Acoustic Waves by a Pair of Uniformly Magnetized Flux Tubes. *Thomas J. Bogdan & David C. Fox.* 379, 758, 174-B10 (1991)
- FOX, GEOFFREY K. Stellar Occultation of Polarized Light from Circumstellar Electrons. II. Flat Envelopes Viewed at Arbitrary Inclination. *Geoffrey K. Fox & John C. Brown.* 375, 300, 114-F1 (1991)
- Stellar Occultation of Polarized Light from Circumstellar Electrons. III. General Axisymmetric Envelopes. *Geoffrey K. Fox.* 379, 663, 173-A1 (1991)
- FOX, PETER A. Compressible Magnetic Convection: Formulation and Two-dimensional Models. *Peter A. Fox, Michael L. Theobald, & Sabatino Sofia.* 383, 860, 225-A1 (1991)
- FRAIL, D. A. Does the Vela Pulsar Have "Wisps"? *M. F. Bietenholz, D. A. Frail, & T. H. Hankins.* 376, L41, 137-C1 (1991)
- H I Absorption Measurements toward 15 Pulsars and the Radial Distribution of Diffuse Ionized Gas in the Galaxy. *D. A. Frail, J. M. Cordes, T. H. Hankins, & J. M. Weisberg.* 382, 168, 202-C10 (1991)
- FRAIX-BURNET, D. Oblique Mixed Shocks in Extragalactic Jets. *D. Fraix-Burnet & G. Pelletier.* 367, 86, 13-B1 (1991)
- FRANCESCHINI, A. Small-Scale Fluctuations and Angular Correlations of the X-Ray Background in the HEAO 1 A-2 Energy Band: Constraints on Clustering of X-Ray Sources. *J. M. Marín-Mirón, G. De Zotti, E. A. Boldt, F. E. Marshall, L. Danese, A. Franceschini, & M. Persic.* 379, 507, 171-A4 (1991)
- FRANCIS, PAUL J. A High Signal-to-Noise Ratio Composite Quasar Spectrum. *Paul J. Francis, Paul C. Hewett, Craig B. Foltz, Frederic H. Chaffee, Ray J. Weymann, & Simon L. Morris.* 373, 465, 93-F10 (1991)
- FRANCO, J. Evolution of Dust Grains through a Hot Gaseous Halo. *A. Ferrara, F. Ferrini, J. Franco, & B. Barsella.* 381, 137, 190-F9 (1991)
- FRANCO, JOSÉ. Photolevititation of Diffuse Clouds. *José Franco, Federico Ferrini, Andrea Ferrara, & Bruno Barsella.* 366, 443, 8-D1 (1991)
- FRANSSON, CLAES. Circumstellar Emission from SN 1987A. *Peter Lundqvist & Claes Fransson.* 380, 575, 185-D1 (1991)
- FRAUNX, MARIJN. The Ordered Nature of Elliptical Galaxies: Implications for Their Intrinsic Angular Momenta and Shapes. *Marijn Franx, Garth Illingworth, & Tim de Zeeuw.* 383, 112, 213-D7 (1991)

- FRANZ, O. G. Binary Star Observations with the *Hubble Space Telescope* Fine Guidance Sensors. I. ADS 11300. *O. G. Franz, T. J. N. Kreidl, L. W. Wasserman, A. J. Bradley, G. F. Benedict, P. D. Hemenway, W. H. Jefferys, B. McArthur, J. E. McCartney, E. Nelan, P. J. Shelus, D. Story, A. L. Whipple, R. L. Duncombe, L. W. Fredrick, & Wm. F. van Altena.* 377, L17, 143-C6 (1991)
- FRAZER, JAMES. See DUNCAN, DOUGLAS K., et al. Ca II H and K Measurements Made at Mount Wilson Observatory, 1966-1983.
- FREDRICK, L. W. See FRANZ, O. G., et al. Binary Star Observations with the *Hubble Space Telescope* Fine Guidance Sensors. I. ADS 11300.
- FREEDMAN, S. J. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- FREEDMAN, WENDY L. New Cepheid Distances to Nearby Galaxies Based on BVRI CCD Photometry. II. The Local Group Galaxy M33. *Wendy L. Freedman, Christine D. Wilson, & Barry F. Madore.* 372, 455, 81-D9 (1991)
- FREEMAN, KENNETH C. See GRIEST, KIM, et al. Gravitational Microlensing as a Method of Detecting Disk Dark Matter and Faint Disk Stars.
- FRENK, CARLOS S. Galaxy Formation through Hierarchical Clustering. *Simon D. M. White & Carlos S. Frenk.* 379, 52, 163-F3 (1991)
- FRERKING, M. A. See WANNIER, P. G., et al. Water in Dense Molecular Clouds.
- FREUDLING, WOLFRAM. Second-Order Perturbation Theory in  $\Omega \neq 1$  Friedmann Models. *Hugo Martel & Wolfram Freudling.* 371, 1, 60-B1 (1991)
- The Peculiar Velocity Field in the Hercules Region. *Wolfram Freudling, Hugo Martel, & Martha P. Haynes.* 377, 349, 144-B12 (1991)
- FRICKE, K. J. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- FRIED, J. W. The Complete Sample of 1 Jansky BL Lacertae Objects. I. Summary Properties. *M. Stickel, P. Padovani, C. M. Urry, J. W. Fried, & H. Kühr.* 374, 431, 104-E1 (1991)
- FRIED, R. Optical Identification of the X-Ray Source GS 2023+338 as V404 Cygni. *R. Mark Wagner, Sumner G. Starfield, Steve B. Howell, Tobias J. Kreidl, S. J. Bus, A. Cassatella, R. Bertram, & R. Fried.* 378, 293, 154-E10 (1991)
- FROGEL, JAY A. Galactic Bulge M Giants. IV. 0.5-2.5 Micron Spectrophotometry and Abundances for Stars in Baade's Window. *D. M. Terndrup, Jay A. Frogel, & A. E. Whitford.* 378, 742, 161-E5 (1991)
- FRONTERA, F. X-Ray Observations of the Seyfert 1 Galaxy Markarian 464. *L. Piro, G. Mai, E. Costa, D. Dal Fiume, F. Frontera, & E. Morelli.* 380, 357, 182-F9 (1991)
- FRUEHLING, M. L. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- FRUSCIONE, ANTONELLA. Search for Starbursts among X-Ray-selected Galaxies: Optical Spectroscopy. *Antonella Fruscione & Richard E. Griffiths.* 380, L13, 181-C1 (1991)
- FRY, D. J. I. Analysis and Solution of the Light and Radial Velocity Curves of the Contact Binary TY Bootis. *E. F. Milone, G. Groisman, D. J. I. Fry, & D. H. Bradstreet.* 370, 677, 56-G5 (1991)
- FRY, J. N. Fourier Spectra of Three-dimensional Data. *David J. Baumgart & J. N. Fry.* 375, 25, 111-C11 (1991)
- FRYXELL, B. A. Accretion in Wind-driven X-Ray Sources. *Ronald E. Taam, Albert Fu, & B. A. Fryxell.* 371, 696, 70-C1 (1991)
- FRYXELL, BRUCE. Instabilities and Clumping in SN 1987A. I. Early Evolution in Two Dimensions. *Bruce Fryxell, Ewald Müller, & David Arnett.* 367, 619, 21-A5 (1991)
- Radiative-hydrodynamical Simulations of Accretion Disk Coronae. *Fulvio Melia, Gregory J. Zylstra, & Bruce Fryxell.* 377, L101, 150-E11 (1991)
- FU, ALBERT. Accretion in Wind-driven X-Ray Sources. *Ronald E. Taam, Albert Fu, & B. A. Fryxell.* 371, 696, 70-C1 (1991)
- FUJIKAWA, B. K. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- FUJIMOTO, MASAYUKI Y. Shell Helium Burning in Low-Mass Stars. I. Models in Thermal Equilibrium. *Masayuki Y. Fujimoto & Icko Iben, Jr.* 374, 631, 107-A1 (1991)
- Diffusion and Mixing in Classical Nova Precursors. *Icko Iben, Jr., Masayuki Y. Fujimoto, & Jim MacDonald.* 375, L27, 117-D1 (1991)
- FUKUDA, T. Measurement of the Neutron Capture Rate of the  $^{12}\text{C}(n,\gamma)^{13}\text{C}$  Reaction at Stellar Energy. *Y. Nagai, M. Igashira, K. Takeda, N. Mukai, S. Motoyama, F. Uesawa, H. Kitazawa, & T. Fukuda.* 372, 683, 84-B7 (1991)
- See NAGAI, Y., et al. Capture Rate of the  $^7\text{Li}(n, \gamma)^8\text{Li}$  Reaction by Prompt Gamma-Ray Detection.
- FUKUDA, M. Zero Point of the Supernova Hubble Diagram. *M. Fukugita & C. J. Hogan.* 368, L11, 28-C1 (1991)
- The Distance to the Coma Cluster Using the B-Band Tully-Fisher Relation. *M. Fukugita, S. Okamura, K. Tarusawa, H. J. Rood, & B. A. Williams.* 376, 8, 125-B9 (1991)
- FUKUI, Y. See KOYAMA, K., et al. An X-Ray Pulsator in the Direction of Molecular Cloud MBM 12 (Lynds 1457).
- A Study of  $^{13}\text{CO}$  Cloud Cores in Ophiuchus. *S. Nozawa, A. Mizuno, Y. Teshima, H. Ogawa, & Y. Fukui.* 77, 647, 53-E6 (1991)
- FUKUI, YASUO. A Millimeter-Wave Line Study of L1287: A Case of Induced Star Formation by Stellar Wind Compression? *Ji Yang, Tomofumi Umemoto, Takahiro Iwata, & Yasuo Fukui.* 373, 137, 87-F7 (1991)
- U-shaped Outflow in the Lynds 1221 Dark Cloud: An Example of Interaction of Outflows with Ambient Molecular Clouds. *Tomofumi Umemoto, Naomi Hirano, Osamu Kameya, Yasuo Fukui, Nario Kuno, & Keiya Takakubo.* 377, 510, 146-A13 (1991)
- A Catalog of Bright-rimmed Clouds with IRAS Point Sources: Candidates for Star Formation by Radiation-driven Implosion. I. The Northern Hemisphere. *Koji Sugitani, Yasuo Fukui, & Katsuo Ogura.* 77, 59, 44-B1 (1991)
- FULGIONE, W. See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- FULLER, G. A. Thermal and Nonthermal Motions in Dense Cores. *P. C. Myers, E. F. Ladd, & G. A. Fuller.* 372, L95, 85-E9 (1991)
- Anatomy of the Barnard 5 Core. *G. A. Fuller, P. C. Myers, W. J. Welch, P. F. Goldsmith, W. D. Langer, B. G. Campbell, S. Guilloteau, & R. W. Wilson.* 376, 135, 126-E10 (1991)
- Dense Cores in Dark Clouds. VI. Shapes. *P. C. Myers, G. A. Fuller, A. A. Goodman, & P. J. Benson.* 376, 561, 133-D1 (1991)
- Far-Infrared and Submillimeter Wavelength Observations of Star-forming Dense Cores. II. Images. *E. F. Ladd, Fred C. Adams, S. Casey, J. A. Davidson, G. A. Fuller, D. A. Harper, P. C. Myers, & R. Padman.* 382, 555, 208-D7 (1991)
- FULLER, G. M. Primordial  $^4\text{He}$  as a Test of Big Bang Nucleosynthesis. *G. M. Fuller, R. N. Boyd, & J. D. Kalen.* 371, L11, 66-B7 (1991)
- Effects of Negatively Charged Massive Particles on Primordial Stars. *R. N. Boyd & G. M. Fuller.* 383, 615, 221-G12 (1991)
- FULLER, GEORGE M. Neutrino Oscillations and the Leptonic Charge of the Universe. *Marin J. Savage, Robert A. Malaney, & George M. Fuller.* 368, 1, 23-B1 (1991)
- High-Temperature Neutrino-Nucleus Processes in Stellar Collapse. *George M. Fuller & Bradley S. Meyer.* 376, 701, 135-A12 (1991)
- FULLERTON, A. W. Detection of Small-Amplitude Pulsations in HD 34656 (O7 II). *A. W. Fullerton, D. R. Gies, & C. T. Bolton.* 368, L35, 35-C1 (1991)
- FUSCO-FEMIANO, R. See BAZZANO, A., et al. Hard X-Rays from Coma Cluster Region: Erratum.
- FUSELIER, S. A. Densities and Abundances of Hot Cometary Ions in the Coma of P/Halley. *M. Neugebauer, R. Goldstein, B. E. Goldstein, S. A. Fuselier, H. Balsiger, & W.-H. Ip.* 372, 291, 77-E6 (1991)
- Observations of Solar Wind Ion Charge Exchange in the Comet Halley Coma. *S. A. Fuselier, E. G. Shelley, B. E. Goldstein, R. Goldstein, M. Neugebauer, W.-H. Ip, H. Balsiger, & H. Rème.* 379, 734, 173-G8 (1991)
- FUSI PECCI, FLAVIO. Globular Cluster Mass Functions. *Harvey B. Richer, Gregory G. Fahrlman, Roberto Buonanno, Flavio Fusi Pecci, Leonard Searle, & Ian B. Thompson.* 381, 147, 190-G7 (1991)

- GABRIEL, A. H. The O VII Soft X-Ray Spectrum and Its Application to Hot Plasmas in Astrophysics. *A. H. Gabriel, F. Bely-Dubau, P. Faucher, & L. W. Acton.* 378, 438, 156-D1 (1991)
- GABRYS, CHARLES M. Laboratory Infrared Spectra of CH<sub>2</sub>D<sup>+</sup> and HCCD<sup>+</sup> and Predicted Microwave Transitions. *Mathias Rösslein, Mary-Frances Jagod, Charles M. Gabrys, & Takeshi Oka.* 382, L51, 205-F1 (1991)
- GAISER, T. K. Signatures of Cosmic-Ray Interactions on the Solar Surface. *D. Seckel, Todor Stanev, & T. K. Gaisser.* 382, 652, 209-F8 (1991)
- GALEOTTI, P. See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- GALLAGHER, JOHN S., III. Far-Infrared Properties of NGC 6822. *John S. Gallagher III, Deidre A. Hunter, Fred C. Gillett, & Walter L. Rice.* 371, 142, 61-G1 (1991)
- EXTRAPLANAR IONIZED GAS AND KINEMATICS IN THE EDGE-ON GALAXY NGC 891. *Jean W. Keppel, Ralf-Jürgen Dettmar, John S. Gallagher III, & Morton S. Roberts.* 374, 507, 105-D6 (1991)
- GALLINO, R. *s*-Process Nucleosynthesis in Massive Stars and the Weak Component. I. Evolution and Neutron Captures in a 25 M<sub>⊙</sub> Star. *C. M. Raiteri, M. Busso, R. Gallino, G. Picchio, & L. Pulone.* 367, 228, 14-G13 (1991)
- s*-Process Nucleosynthesis in Massive Stars and the Weak Component. II. Carbon Burning and Galactic Enrichment. *C. M. Raiteri, M. Busso, R. Gallino, & G. Picchio.* 371, 665, 69-G6 (1991)
- GALLOWAY, E. T. Can Phase Space Theory Reproduce Experimental Neutral Product Branching Ratios for Dissociative Recombination Reactions? *E. T. Galloway & Eric Herbst.* 376, 531, 133-A8 (1991)
- GALUK, K. See SMOOT, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- GAMMIE, CHARLES F. The Velocity Dispersion of Giant Molecular Clouds. II. Mathematical and Numerical Refinements. *Charles F. Gammie, Jeremiah P. Ostriker, & Chanda J. Jog.* 378, 565, 159-D5 (1991)
- GAO, BIN. Fokker-Planck Calculations of Star Clusters with Primordial Binaries. *Bin Gao, Jeremy Goodman, Haldan Cohn, & Brian Murphy.* 370, 567, 55-E1 (1991)
- The Three-Point Correlation Function for Abell Clusters: Observations and Simulations. *J. Richard Gott III, Bin Gao, & Changbom Park.* 383, 90, 213-B10 (1991)
- GARAY, G. A <sup>12</sup>CO Survey of the Small Magellanic Cloud. *M. Rubio, G. Garay, J. Montani, & P. Thaddeus.* 368, 173, 25-C1 (1991)
- Multifrequency VLA Observations of Radio Continuum from IRAS 16293–2422. *R. Estalella, G. Anglada, L. F. Rodriguez, & G. Garay.* 371, 626, 69-C12 (1991)
- GARAY, GUIDO. The Dense Molecular Envelope around the Compact H II Region G5.89–0.39 (W28 A2). *Yolanda Gómez, Luis F. Rodríguez, Guido Garay, & James M. Moran.* 377, 519, 146-B9 (1991)
- GARCIA, BEATRIZ. Spectroscopic Binaries in the Open Cluster Trumpler 16. *Hugo Levato, Stella Malaroda, Nidia Morrell, Beatriz Garcia, & Carlos Hernández.* 75, 869, 13-C13 (1991)
- GARCIA LOPEZ, RAMÓN J. Li Depletion in F Stars by Internal Gravity Waves. *Ramón J. García López & Hendrik C. Spruit.* 377, 268, 141-C7 (1991)
- GARCIA-MUNOZ, M. See ADAMS, J. H., JR., et al. The Charge State of the Anomalous Component of Cosmic Rays.
- GARDEN, R. P. A Spectroscopic Study of the DR 21 Outflow Source. II. The Vibrational H<sub>2</sub> Line Emission. *R. P. Garden, T. R. Geballe, I. Gatley, & D. Nadeau.* 366, 474, 8-G1 (1991)
- A Spectroscopic Study of the DR 21 Outflow Source. III. The CO Line Emission. *R. P. Garden, M. Hayashi, I. Gatley, T. Hasegawa, & N. Kaifu.* 374, 540, 105-G11 (1991)
- GARDNER, J. P. A Deep Imaging and Spectroscopic Survey of Faint Galaxies. *S. J. Lilly, L. L. Cowie, & J. P. Gardner.* 369, 79, 37-A1 (1991)
- GARILLI, B. Coordinated X-Ray, Ultraviolet, and Optical Observations of 3C 120. *L. Maraschi, L. Chiappetti, R. Falomo, B. Garilli, M. Malkan, G. Tagliaferri, E. G. Tanzi, & A. Treves.* 368, 138, 24-F9 (1991)
- GARMANY, CATHARINE D. On Winds and X-Rays of O-Type Stars. *Tomasz Chlebowski & Catharine D. Garmany.* 368, 241, 26-B1 (1991)
- GARNAVICH, PETER. Near-Infrared Time-resolved Spectroscopy of the Cataclysmic Variable YY Draconis. *Mario Mateo, Paula Szkody, & Peter Garnavich.* 370, 370, 51-G8 (1991)
- GARNET, DONALD R. He II Emission in Extragalactic H II Regions. *Donald R. Garnet, Robert C. Kennicutt, Jr., You-Hua Chu, & Evan D. Skillman.* 373, 458, 93-E14 (1991)
- GARNETT, J. D. Infrared and Visible Photometry of the Gravitational Lens System 2237+030. *Daniel Nadeau, H. K. C. Yee, W. J. Forrest, J. D. Garnet, Z. Ninkov, & J. L. Pipkin.* 376, 430, 131-G1 (1991)
- GARY, DALE E. First Interferometric Observations of Solar Microwave Millisecond Spike Bursts. *Dale E. Gary, G. J. Hurford, & D. J. Flees.* 369, 255, 39-B1 (1991)
- GASKELL, C. M. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- GASKELL, C. MARTIN. On the Size of the Broad-Line Region in Arakelian 120. *Bradley M. Peterson & C. Martin Gaskell.* 368, 152, 25-A1 (1991)
- Structure and Kinematics of the Broad-Line Regions in Active Galaxies from IUE Variability Data. *Anuradha P. Koratkar & C. Martin Gaskell.* 75, 719, 11-B5 (1991)
- The Shape of the Ultraviolet Continuum of Quasars and Intergalactic Dust. *F. H. Cheng, C. Martin Gaskell, & Anuradha P. Koratkar.* 370, 487, 54-D9 (1991)
- Radius-Luminosity and Mass-Luminosity Relationships for Active Galactic Nuclei. *Anuradha P. Koratkar & C. Martin Gaskell.* 370, 161, 59-B1 (1991)
- IUE Observations of NGC 5548, 1978–1988: The Sizes and Kinematics of the Broad-Line Region. *Anuradha P. Koratkar & C. Martin Gaskell.* 375, 85, 112-A13 (1991)
- GATLEY, I. A Spectroscopic Study of the DR 21 Outflow Source. II. The Vibrational H<sub>2</sub> Line Emission. *R. P. Garden, T. R. Geballe, I. Gatley, & D. Nadeau.* 366, 474, 8-G1 (1991)
- A Spectroscopic Study of the DR 21 Outflow Source. III. The CO Line Emission. *R. P. Garden, M. Hayashi, I. Gatley, T. Hasegawa, & N. Kaifu.* 374, 540, 105-G11 (1991)
- GATLEY, IAN. A 2.2 Micron Survey in the L1630 Molecular Cloud. *Elizabeth A. Lada, D. L. DePoy, Neal J. Evans II, & Ian Gatley.* 371, 171, 62-C1 (1991)
- Two Micron Morphology of Candidate Protostars. *Motohide Tamura, Ian Gatley, William Waller, & Michael W. Werner.* 374, L25, 103-E7 (1991)
- Infrared Fluorescence of H<sub>2</sub> in NGC 6240: A Starburst Origin for the H<sub>2</sub> Luminosity. *Masuo Tanaka, Tetsuo Hasegawa, & Ian Gatley.* 374, 516, 105-E9 (1991)
- Infrared Images of M17. *Charles J. Lada, D. L. DePoy, K. M. Merrill, & Ian Gatley.* 374, 533, 105-G1 (1991)
- Infrared Polarization Images of Star-forming Regions. I. The Ubiquity of Bipolar Structure. *M. Tamura, Ian Gatley, R. R. Joyce, M. Ueno, H. Suto, & M. Sekiguchi.* 378, 611, 160-A1 (1991)
- GAUME, R. A. NGC 7538 IRS 1: Subarcsecond Resolution Recombination Line and <sup>15</sup>NH<sub>3</sub> Maser Observations. *R. A. Gaume, K. J. Johnston, H. A. Nguyen, T. L. Wilson, H. R. Dickel, W. M. Goss, & M. C. H. Wright.* 376, 608, 133-G12 (1991)
- GAUTIER, THOMAS N., III. Near-Infrared Emission-Line Images of Three Herbig-Haro Objects. *Karl R. Stapelfeldt, Charles A. Beichman, J. Jeff Hester, Nicholas Z. Scoville, & Thomas N. Gautier III.* 371, 226, 63-A1 (1991)
- GAVAZZI, G. Large-Scale Peculiar Velocity Fields in Superclusters of Galaxies. *G. Gavazzi, M. Scoggio, A. Boselli, & G. Trinchieri.* 382, 19, 200-C5 (1991)
- GAVAZZI, GIUSEPPE. H I Mapping of Galaxies in the Cluster A1367. *John M. Dickey & Giuseppe Gavazzi.* 373, 347, 92-C12 (1991)
- GAYLEY, K. G. Temperature-dependent Saturation of Hydrogen Lines in Solar Flares. *K. G. Gayley.* 374, 773, 108-F5 (1991)
- Inferring Chromospheric Flare Heating from Hydrogen-Line Wings. *K. G. Gayley & R. C. Canfield.* 380, 660, 186-D1 (1991)

- GEBALLE, T. R.** A Spectroscopic Study of the DR 21 Outflow Source. II. The Vibrational H<sub>2</sub> Line Emission. *R. P. Garden, T. R. Geballe, I. Gatley, & D. Nadeau.* 366, 474, 8-G1 (1991)
- Distribution of Dust about o Ceti and α Orionis Based on 11 Micron Spatial Interferometry. *M. Bester, W. C. Danchi, C. G. Degiacomi, C. H. Townes, & T. R. Geballe.* 367, L27, 17-E1 (1991)
- Mapping of Infrared Helium and Hydrogen Line Profiles in the Central Few Arcseconds of the Galaxy. *T. R. Geballe, K. Krisciunas, J. A. Bailey, & R. Wade.* 370, L73, 59-C8 (1991)
- The H<sub>2</sub> Line Profiles in the Cygnus Loop: Evidence for J-Shocks with Magnetic Precursors. *James R. Graham, Gillian S. Wright, & T. R. Geballe.* 372, L21, 79-C7 (1991)
- The Extinction to the H<sub>2</sub> Line Emission in the DR 21 Outflow Source. *Daniel Nadeau, Martin Riopel, & T. R. Geballe.* 372, L103, 85-F5 (1991)
- A Sensitive Upper Limit on the Methane Abundance in Comet Levy (1990c). *T. Y. Brooke, A. T. Tokunaga, H. A. Weaver, G. Chin, & T. R. Geballe.* 372, L113, 85-G1 (1991)
- Two Micron Spectroscopy of Infrared Sources in NGC 2071. *D. M. Walther, T. R. Geballe, & E. I. Robson.* 377, 246, 141-A9 (1991)
- Interstellar Solid CO: Polar and Nonpolar Interstellar Ices. *A. G. G. M. Tielens, A. T. Tokunaga, T. R. Geballe, & F. Baas.* 381, 181, 191-C5 (1991)
- See CARSWELL, R. E., et al. The Systemic Redshift of the Quasar 1331+170.
- GEBHARDT, KARL.** Bound Populations around cD Galaxies and cD Velocity Offsets in Clusters of Galaxies. *Karl Gebhardt & Timothy C. Beers.* 383, 72, 213-A1 (1991)
- GEHMAN, CURTIS S.** Vertical Distribution and Support of Galactic H I. *Felix J. Lockman & Curtis S. Gehman.* 382, 182, 202-D12 (1991)
- GEHRELS, N.** GRIS Observations of <sup>26</sup>Al Gamma-Ray Line Emission from Two Points in the Galactic Plane. *B. J. Teegarden, S. D. Barthelmy, N. Gehrels, J. Tueller, M. Leventhal, & C. J. MacCallum.* 375, L9, 117-B4 (1991)
- GRIS Observations of Positron Annihilation Radiation from the Galactic Center. *N. Gehrels, S. D. Barthelmy, B. J. Teegarden, J. Tueller, M. Leventhal, & C. J. MacCallum.* 375, L13, 117-B10 (1991)
- GEIS, N.** The 158 Micron [C II] Line: A Measure of Global Star Formation Activity in Galaxies. *G. J. Stacey, N. Geis, R. Genzel, J. B. Lugten, A. Poglitsch, A. Sternberg, & C. H. Townes.* 373, 423, 93-C1 (1991)
- A Survey of the 158 Micron [C II] Fine-Structure Line in the Central 50 Parsecs of The Galaxy. *A. Poglitsch, G. J. Stacey, N. Geis, M. Haggerty, J. Jackson, M. Rumitz, R. Genzel, & C. H. Townes.* 374, L33, 110-B5 (1991)
- The Optical Depth of the 158 Micron [C II] Line: Detection of the  $F = 1 \rightarrow 0$  [<sup>13</sup>C II] Hyperfine-Structure Component. *G. J. Stacey, C. H. Townes, A. Poglitsch, S. C. Madden, J. M. Jackson, F. Herrmann, R. Genzel, & N. Geis.* 382, L37, 205-E1 (1991)
- GELDZAHLER, B. J.** The Radio "lobes" of Scorpius X-1 Are Unrelated Background Sources. *E. B. Fomalont & B. J. Geldzahler.* 383, 289, 215-G1 (1991)
- SELLER, MARGARET J.** The Kinematics of Abell Clusters: Erratum. *Ann. I. Zabludoff, John P. Huchra, & Margaret J. Geller.* 75, 629, 9-C1 (1991) (Orig. paper in 74, 1, 30-B1 (1990))
- Measures of Large-Scale Structure in the CfA Redshift Survey Slices. *Valérie de Lapparent, Margaret J. Geller, & John P. Huchra.* 369, 273, 41-B5 (1991)
- The Evolution of Void-filled Cosmological Structures. *Enikő Regős & Margaret J. Geller.* 377, 14, 138-C1 (1991)
- Void Statistics of the CfA Redshift Survey. *Michael S. Vogeley, Margaret J. Geller, & John P. Huchra.* 382, 44, 200-E12 (1991)
- GENNARI, S.** Infrared Spectroscopy of T Tauri Stars. *C. Giovanardi, S. Gennari, A. Natta, & R. Stanga.* 367, 173, 14-B11 (1991)
- GENZEL, R.** High-Resolution Imaging of Brackett-γ and H<sub>2</sub> 1-0 S(1) Emission in the Seyfert Galaxy NGC 1068. *V. Rotaciuc, A. Krabbe, M. Cameron, S. Drapatz, R. Genzel, A. Sternberg, & J. W. V. Storey.* 370, L23, 53-D6 (1991)
- The Molecular Interstellar Medium and the Near-Infrared Continuum of the Barred LINER NGC 6764. *A. Eckart, M. Cameron,*
- J. M. Jackson, R. Genzel, A. I. Harris, W. Wild, & H. Zinnecker.* 372, 67, 74-G9 (1991)
- Parsec-Scale Penetration of Ultraviolet Photons into Molecular Clouds: [C II] 158 Micron Mapping of W3, NGC 1977, and NGC 2023. *J. E. Howe, D. T. Jaffe, R. Genzel, & G. J. Stacey.* 373, 158, 88-A5 (1991)
- The 158 Micron [C II] Line: A Measure of Global Star Formation Activity in Galaxies. *G. J. Stacey, N. Geis, R. Genzel, J. B. Lugten, A. Poglitsch, A. Sternberg, & C. H. Townes.* 373, 423, 93-C1 (1991)
- A Survey of the 158 Micron [C II] Fine-Structure Line in the Central 50 Parsecs of The Galaxy. *A. Poglitsch, G. J. Stacey, N. Geis, M. Haggerty, J. Jackson, M. Rumitz, R. Genzel, & C. H. Townes.* 374, L33, 110-B5 (1991)
- A Cluster of He I Emission-Line Stars in the Galactic Center. *A. Krabbe, R. Genzel, S. Drapatz, & V. Rotaciuc.* 382, L19, 205-C1 (1991)
- The Optical Depth of the 158 Micron [<sup>12</sup>C II] Line: Detection of the  $F = 1 \rightarrow 0$  [<sup>13</sup>C II] Hyperfine-Structure Component. *G. J. Stacey, C. H. Townes, A. Poglitsch, S. C. Madden, J. M. Jackson, F. Herrmann, R. Genzel, & N. Geis.* 382, L37, 205-E1 (1991)
- First Observations of the CO  $J = 6-5$  Transition in Starburst Galaxies. *A. I. Harris, R. E. Hills, J. Stutzki, U. U. Graf, A. P. G. Russell, & R. Genzel.* 382, L75, 211-C7 (1991)
- GEORGE, I. M.** See EDELSON, R. A., et al. Rapid Ultraviolet Variability in the BL Lacertae Object PKS 2155-304.
- GERARDI, G.** See MASSARO, E., et al. Detection of a Feature at 0.44 MeV in the Crab Pulsar Spectrum with FIGARO II: A Redshifted Positron Annihilation Line?
- GERIN, M.** Detection of Interstellar H<sub>3</sub>O<sup>+</sup>: A Confirming Line. *Alwyn Wootten, J. G. Mangum, B. E. Turner, M. Bogey, F. Boulanger, F. Combes, P. J. Encrernaz, & M. Gerin.* 380, L79, 188-E6 (1991)
- GEROYANNIS, V. S.** Models of White Dwarfs under Rapid Uniform or Differential Rotation: Numerical Results. II. *V. S. Geroyannis & A. A. Hadjopoulos.* 75, 499, 7-D11 (1991)
- GERVASI, M.** High-Latitude Galactic Emission and the Search for Anisotropies of the Cosmic Background Radiation. *S. Masi, P. de Bernardis, M. De Petris, M. Epifani, M. Gervasi, & G. Guarini.* 366, L51, 11-B1 (1991)
- GEZARI, DANIEL.** Polarimetric Imaging of the Galactic Center at 12.4 Microns: The Detailed Magnetic Field Structure in the Northern Arm and East-West Bar. *David K. Aitken, Daniel Gezari, Craig H. Smith, Mark McCaughrean, & Patrick F. Roche.* 380, 419, 183-D10 (1991)
- GHOSH, K. K.** EXOSAT Observations of the Seyfert 1 Galaxy NGC 3516. *K. K. Ghosh & S. Soundararajaperumal.* 383, 574, 221-D1 (1991)
- GIACCONI, R.** X-Ray Luminosity Functions of Clusters of Galaxies. *A. Cavaliere, R. Burg, & R. Giacconi.* 366, L61, 11-B11 (1991)
- The CfA Einstein Observatory Extended Deep X-Ray Survey. *F. A. Primini, S. S. Murray, J. Huchra, R. Schild, R. Burg, & R. Giacconi.* 374, 440, 104-E12 (1991)
- GIALLONGO, E.** BL Lacertae Objects and Radio-loud Quasars within an Evolutionary Unified Scheme. *F. Vagnetti, E. Giallongo, & A. Cavaliere.* 368, 366, 29-E11 (1991)
- Optical Variability of Quasars: Statistics and Cosmological Properties. *E. Giallongo, D. Trevese, & F. Vagnetti.* 377, 345, 144-B6 (1991)
- GIAMPAPA, MARK S.** The Chromospheric Activity of Low-Mass Stars in the Hyades. *John R. Stauffer, Mark S. Giampapa, William Herbst, James M. Vincent, Lee W. Hartmann, & Robert A. Stern.* 374, 142, 99-G1 (1991)
- GIES, D. R.** Detection of Small-Amplitude Pulsations in HD 34656 (O7 II). *A. W. Fullerton, D. R. Gies, & C. T. Bolton.* 368, L35, 35-C1 (1991)
- GIES, DOUGLAS R.** A Spectroscopic Search for Colliding Stellar Winds in O-Type Close Binary Systems. I. AO Cassiopeiae. *Douglas R. Gies & Michael S. Wiggs.* 375, 321, 114-G10 (1991)
- Tomographic Separation of Composite Spectra: The Components of the O-Star Spectroscopic Binary AO Cassiopeiae. *William G. Baguado, Jr., & Douglas R. Gies.* 376, 266, 128-C1 (1991)
- GIPANOV, M.** See BARRET, D., et al. Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2.

- GILER, M. Cosmic Rays and Cosmological Microwave Background Fluctuations. *A. J. Banday, M. Giler, B. Szabelska, J. Szabelski, & A. W. Wolfendale.* 375, 432, 118-B5 (1991)
- GILFANOV, M. See BOUCHET, L., et al. SIGMA Discovery of Variable  $e^+e^-$  Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7-2942.
- See SUNYAEV, R., et al. Three Spectral States of 1E 1740.7-2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature.
- GILLETT, FRED C. Far-Infrared Properties of NGC 6822. *John S. Gallagher III, Deidre A. Hunter, Fred C. Gillett, & Walter L. Rice.* 371, 142, 61-G1 (1991)
- GILLILAND, RONALD L. Detection of Possible  $p$ -Mode Oscillations on Procyon. *Timothy M. Brown, Ronald L. Gilliland, Robert W. Noyes, & Lawrence W. Ramsey.* 368, 599, 32-E8 (1991)
- First Results from the Goddard High-Resolution Spectrograph: The Galactic Halo and the Ly $\alpha$  Forest at Low Redshift in 3C 273. *Simon L. Morris, Ray J. Weymann, Blair D. Savage, & Ronald L. Gilliland.* 377, L21, 143-C11 (1991)
- First Results from the Goddard High-Resolution Spectrograph: A Demonstration of Spectral Resolution and Experiments with Deconvolution. *Glenn M. Wahlgren, David S. Leckrone, Steven N. Shore, Don J. Lindler, Ronald L. Gilliland, & Dennis C. Ebbets.* 377, L41, 143-E6 (1991)
- GILMORE, DIANE M. On the Interpretation of the Morphology-Density Relation for Galaxies in Clusters. *Bradley C. Whitmore & Diane M. Gilmore.* 367, 64, 12-G1 (1991)
- GILMORE, GERARD. The Galactic Disk Surface Mass Density and the Galactic Force  $K_x$  at  $z = 1.1$  Kiloparsecs. *Konrad Kuijken & Gerard Gilmore.* 367, L9, 17-C1 (1991)
- Chemical Evolution with Bursts of Star Formation: Element Ratios in Dwarf Galaxies. *Gerard Gilmore & Rosemary F. G. Wyse.* 367, L55, 22-C1 (1991)
- First Detection of Beryllium in a Very Metal Poor Star: A Test of the Standard Big Bang Model. *Gerard Gilmore, Bengt Edvardsson, & P. E. Nissen.* 378, 17, 151-C1 (1991)
- GILMOZZI, R. See HESTER, J. JEFF, et al. Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0'.1.
- Properties of the SN 1987A Circumstellar Ring and the Distance to the Large Magellanic Cloud. *N. Panagia, R. Gilmozzi, F. Macchetto, H.-M. Adorf, & R. P. Kirshner.* 380, L23, 181-D1 (1991)
- GILROY, KALPANA KRISHNASWAMY. Carbon Isotope Ratios along the Giant Branch of M67. *Kalpana Krishnaswamy Gilroy & Jeffery A. Brown.* 371, 578, 68-F7 (1991)
- GIOIA, I. M. The Number Count Distribution for X-Ray-selected BL Lacertae Objects and Constraints on the Luminosity Function. *Anna Wolter, I. M. Gioia, T. Maccacaro, S. L. Morris, & J. T. Stocke.* 369, 314, 41-F5 (1991)
- The Einstein Observatory Extended Medium-Sensitivity Survey. II. The Optical Identifications. *John T. Stocke, Simon L. Morris, I. M. Gioia, T. Maccacaro, R. Schild, A. Wolter, Thomas A. Fleming, & J. Patrick Henry.* 76, 813, 36-B1 (1991)
- GIOIA, ISABELLA M. The Properties of X-Ray-selected Active Galactic Nuclei. I. Luminosity Function, Cosmological Evolution, and Contribution to the Diffuse X-Ray Background. *Tomaso Maccacaro, Roberto Della Ceca, Isabella M. Gioia, Simon L. Morris, John T. Stocke, & Anna Wolter.* 374, 117, 99-D11 (1991)
- The Luminosity Function and Cosmological Evolution of X-Ray-selected BL Lacertae Objects. *Simon L. Morris, John T. Stocke, Isabella M. Gioia, Rudy E. Schild, Anna Wolter, Tommaso Maccacaro, & Roberto Della Ceca.* 380, 49, 176-F1 (1991)
- GIOMMI, P. The EXOSAT High Galactic Latitude Survey. *P. Giommi, G. Tagliaferri, K. Beuermann, G. Branduardi-Raymont, R. Brisenden, U. Graser, K. O. Mason, J. D. P. Mittaz, P. Murdin, G. Pooley, H.-C. Thomas, & I. Tuohy.* 378, 77, 152-A5 (1991)
- Persistence and Change in the Soft X-Ray Spectrum of the Quasar PG 1211+143. *Martin Elvis, P. Giommi, Belinda J. Wilkes, & Jonathan McDowell.* 378, 537, 159-B1 (1991)
- GIOVANARDI, C. Infrared Spectroscopy of T Tauri Stars. *C. Giovanardi, S. Gennari, A. Natta, & R. Stanga.* 367, 173, 14-B1 (1991)
- GIOVANELLI, R. Neutral Hydrogen Observations of Galaxies in Superclusters. *M. P. Haynes & R. Giovanelli.* 77, 331, 49-B1 (1991)
- GIOVANELLI, RICCARDO. Scale-invariant Clustering in the Large-Scale Distribution of Galaxies. *Luigi Guzzo, Angela Iovino, Guido Chincarini, Riccardo Giovanelli, & Martha P. Haynes.* 382, L5, 205-B1 (1991)
- GIRARDI, M. The Luminosity-Diameter Relation for Disk Galaxies in Different Environments. *M. Girardi, A. Biviano, G. Giuricin, F. Mardirossian, & M. Mezzetti.* 366, 393, 7-F7 (1991)
- Arm Classification and Velocity Gradients in Spiral Galaxies. *A. Biviano, M. Girardi, G. Giuricin, F. Mardirossian, & M. Mezzetti.* 376, 458, 132-B7 (1991)
- GIRAUD, E. On the Nebulosity Surrounding the BL Lacertae Object PKS 2155-304. *R. Falomo, E. Giraud, L. Maraschi, J. Melnick, E. G. Tanzi, & A. Treves.* 380, L67, 188-D1 (1991)
- GIURICIN, G. The Luminosity-Diameter Relation for Disk Galaxies in Different Environments. *M. Girardi, A. Biviano, G. Giuricin, F. Mardirossian, & M. Mezzetti.* 366, 393, 7-F7 (1991)
- Arm Classification and Velocity Gradients in Spiral Galaxies. *A. Biviano, M. Girardi, G. Giuricin, F. Mardirossian, & M. Mezzetti.* 376, 458, 132-B7 (1991)
- GLASNER, AMI S. Numerical Simulations of Off-Center Detonations in Helium Shells. *Eli Livne & Ami S. Glasner.* 370, 272, 50-E12 (1991)
- GLASPEY, J. W. The Lithium Abundance of M67 Blue Stragglers: A Constraint on the Blue Straggler Phenomenon. *C. J. Prichet & J. W. Glaspey.* 373, 105, 87-C12 (1991)
- GLASSGOLD, A. E. The Formation of Molecules in Protostellar Winds. *A. E. Glassgold, G. A. Mamon, & P. J. Huggins.* 373, 254, 89-B7 (1991)
- GLASSGOLD, ALFRED E. The Temperature of the Circumstellar Envelope of Alpha Orionis. *Bernadette Rodgers & Alfred E. Glassgold.* 382, 606, 209-B1 (1991)
- GLENDENNING, N. K. Structure and Stability of Rotating Relativistic Neutron Stars. *F. Weber, N. K. Glendenning, & M. K. Weigel.* 373, 579, 95-B10 (1991)
- GLENDENNING, A. R. See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- GODEFROID, M. Accurate Oscillator Strengths of Astrophysical Interest for Neutral Oxygen. *E. Biémont, A. Hibbert, M. Godefroid, N. Vaec, & B. C. Fawcett.* 375, 818, 122-G1 (1991)
- GODFREY, PETER D. See OHISHI, MASATOSHI, et al. Detection of a New Carbon-Chain Molecule, CCO.
- GOERTZ, C. K. On the Radial Structure of Saturn's B Ring. *Lin-Hua Shan & C. K. Goertz.* 367, 350, 16-D1 (1991)
- GOLD, R. E. Statistical Properties of Shock-accelerated Ions in the Outer Heliosphere. *L. J. Lanzerotti, R. E. Gold, D. J. Thomson, R. E. Decker, C. G. Maclennan, & S. M. Krimigis.* 380, L93, 188-F10 (1991)
- GOLDEN, R. L. A Measurement of the Cosmic-Ray  ${}^{2}\text{H}$  and  ${}^{3}\text{He}$  Spectra and  ${}^{2}\text{H}/\text{He}$  and  ${}^{3}\text{He}/\text{He}$  Ratios in 1989. *W. R. Webber, R. L. Golden, S. J. Stochaj, J. F. Ormes, & R. E. Sittmayer.* 380, 230, 178-G9 (1991)
- GOLDMAN, ITZHAK. On the Orbital Circularization of Close Binaries. *Itzhak Goldman & Tsvi Mazeh.* 376, 260, 128-B8 (1991)
- Turbulently Generated Magnetic Fields in Clusters of Galaxies. *Itzhak Goldman & Yoel Rephaeli.* 380, 344, 182-E8 (1991)
- GOLDRICH, PETER. Implications of Solar  $p$ -Mode Frequency Shifts. *Peter Goldreich, Norman Murray, Gregory Willette, & Pawan Kumar.* 370, 752, 57-F12 (1991)
- Thermal and Mechanical Damping of Solar  $p$ -Modes. *Peter Goldreich & Pawan Kumar.* 374, 366, 102-F1 (1991)
- GOLDSMITH, P. F. Anatomy of the Barnard 5 Core. *G. A. Fuller, P. C. Myers, W. J. Welch, P. F. Goldsmith, W. D. Langer, B. G. Campbell, S. Guilloteau, & R. W. Wilson.* 376, 135, 126-E10 (1991)
- GOLDSMITH, PAUL F. High-Density Gas in the Core of the Sagittarius B2 Molecular Cloud. *Dariusz C. Lis & Paul F. Goldsmith.* 369, 157, 37-G11 (1991)
- A New Method for Analyzing IRAS Data to Determine the Dust Temperature Distribution. *Taoling Xie, Paul F. Goldsmith, & Weinan Zhou.* 371, L81, 73-D12 (1991)
- The Smoothness of CO Line Profiles in Orion: Implications for Clumpiness. *Jan A. Tauber, Paul F. Goldsmith, & Robert L. Dickman.* 375, 635, 120-E7 (1991)

- GOLDSTEIN, B. E. Densities and Abundances of Hot Cometary Ions in the Coma of P/Halley. *M. Neugebauer, R. Goldstein, B. E. Goldstein, S. A. Fuselier, H. Balsiger, & W.-H. Ip.* 372, 291, 77-E6 (1991)
- Observations of Solar Wind Ion Charge Exchange in the Comet Halley Coma. *S. A. Fuselier, E. G. Shelley, B. E. Goldstein, R. Goldstein, M. Neugebauer, W.-H. Ip, H. Balsiger, & H. Rème.* 379, 734, 173-G8 (1991)
- GOLDSTEIN, JEFFREY J. Discovery of a Doppler-limited CO Line in the Upper Mesosphere of Venus: A New Dynamical Probe. *David Buhl, Gordon Chin, & Jeffrey J. Goldstein.* 369, L17, 40-C1 (1991)
- First Absolute Wind Measurements in the Middle Atmosphere of Mars. *Emmanuel Lellouch, Jeffrey J. Goldstein, Stephen W. Bougher, Gabriel Paubert, & Jan Rosengren.* 383, 401, 217-CS (1991)
- GOLDSTEIN, R. Densities and Abundances of Hot Cometary Ions in the Coma of P/Halley. *M. Neugebauer, R. Goldstein, B. E. Goldstein, S. A. Fuselier, H. Balsiger, & W.-H. Ip.* 372, 291, 77-E6 (1991)
- Observations of Solar Wind Ion Charge Exchange in the Comet Halley Coma. *S. A. Fuselier, E. G. Shelley, B. E. Goldstein, R. Goldstein, M. Neugebauer, W.-H. Ip, H. Balsiger, & H. Rème.* 379, 734, 173-G8 (1991)
- GOLDWURM, A. See BOUCHET, L., et al. SIGMA Discovery of Variable  $e^+e^-$  Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7-2942.
- See SUNYAEV, R., et al. Three Spectral States of 1E 1740.7-2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature.
- GOLIMOWSKI, DAVID A. The Young Supernova Remnants N132D and 1E 0102.2-7219: Limits on the Presence of Rapidly Moving Sulfur. *Barry M. Lasker & David A. Golimowski.* 371, 568, 68-E8 (1991)
- GOLOMBEK, D. Southern IRAS Quasar with Extreme Fe II Emission. *S. Lipari, F. D. Macchetto, & D. Golombek.* 366, L65, 11-C1 (1991)
- GOLUB, L. Flares Observed by the Normal Incidence X-Ray Telescope on 1989 September 11. *M. Herant, F. Pardo, E. Spiller, & L. Golub.* 376, 797, 136-C6 (1991)
- GÓMEZ, D. Analysis of Radiation Pressure Effects in Pulsating Stars through Perturbative Limit Cycle Solutions. *A. Costa, D. Gómez, & C. Ferro Fontán.* 373, 237, 88-G13 (1991)
- GÓMEZ, G. SN 1988A in M58: Departure from  $^{56}\text{Co}$  Decay 700 Days after Explosion. *P. Ruiz-Lapuente, M. Kidger, G. Gómez, R. Canal, & R. López.* 378, L41, 162-E1 (1991)
- GÓMEZ, PERCY L. On the State of the Emitter of the 3.3 Micron Unidentified Infrared Band: Absorption Spectroscopy of Polycyclic Aromatic Hydrocarbon Species. *Gregory C. Flickinger, Thomas J. Wdowiak, & Percy L. Gómez.* 380, L43, 181-F1 (1991)
- GÓMEZ, YOLANDA. The Dense Molecular Envelope around the Compact H II Region G5.89-0.39 (W28 A2). *Yolanda Gómez, Luis F. Rodríguez, Guido Garay, & James M. Moran.* 377, 519, 146-B9 (1991)
- GONZALEZ, J. JESÚS. Galaxy Velocity Dispersions Using a Cross-Correlation Method: Erratum. *Cristina Dalle Ore, S. M. Faber, J. Jesús Gonzalez, Roland Stoughton, & David Burstein.* 375, 427, 116-B12 (1991) (Orig. paper in 366, 38, 1-E5 (1991))
- GONZALEZ, RAYMOND D. First Observations of Macrospicules at 4.8 GHz at the Solar Limb in Polar Coronal Holes. *Shadia Rifai Habbal & Raymond D. Gonzalez.* 376, L25, 130-D1 (1991)
- Multi-Wave Band SMM-VLA Observations of an M2 Flare and an Associated Coronal Mass Ejection. *Robert F. Willson, Joan T. Schmelz, Raymond D. Gonzalez, Kenneth R. Lang, & Kermit L. Smith.* 378, 360, 155-D6 (1991)
- GOODE, PHILIP R. What We Know about the Sun's Internal Rotation from Solar Oscillations. *Philip R. Goode, W. A. Dziembowski, S. G. Korzennik, & E. J. Rhodes, Jr.* 367, 649, 21-C11 (1991)
- Seismology for the Fine Structure in the Sun's Oscillations Varying with Its Activity Cycle. *W. A. Dziembowski & Philip R. Goode.* 376, 782, 136-B1 (1991)
- GOODING, ANDREW K. The Formation of Galaxies and Quasars in a Texture-seeded Cold Dark Matter Cosmogony. *Andrew K. Gooding, David N. Spergel, & Neil Turok.* 372, L5, 79-A13 (1991)
- GOODMAN, A. A. On the Dispersion in Direction of Interstellar Polarization. *P. C. Myers & A. A. Goodman.* 373, 509, 94-C9 (1991)
- Dense Cores in Dark Clouds. VI. Shapes. *P. C. Myers, G. A. Fuller, A. A. Goodman, & P. J. Benson.* 376, 561, 133-D1 (1991)
- GOODMAN, J. A. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- GOODMAN, JEREMY. Fokker-Planck Calculations of Star Clusters with Primordial Binaries. *Bin Gao, Jeremy Goodman, Haldan Cohn, & Brian Murphy.* 370, 567, 55-E1 (1991)
- Hydrodynamics of Collisions between Binary Stars. *Jeremy Goodman & Lars Hernquist.* 378, 637, 160-C11 (1991)
- GOODRICH, R. See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- GOODRICH, R. W. Multidirectional Views of the Active Nucleus of NGC 1068. *J. S. Miller, R. W. Goodrich, & William G. Mathews.* 378, 47, 151-E13 (1991)
- GOODRICH, ROBERT W. Proto-Planetary Nebulae. II. The Shock-heated Bipolar Nebulae GL 618 and M2-56. *Robert W. Goodrich.* 376, 654, 134-D12 (1991)
- GOPAL-KRISHNA. Gaseous Halos of Elliptical Galaxies, the Cosmic Evolution of Their Radio Sizes, and the Phenomenon of Compact Steep-Spectrum Sources. *Gopal-Krishna & Paul J. Wiita.* 373, 325, 92-B1 (1991)
- GOPALSAMY, N. See NITTA, N., et al. Coronal Magnetic Structures Observing Campaign. I. Simultaneous Microwave and Soft X-Ray Observations of Active Regions at the Solar Limb.
- Large-Scale Features of the Sun at 20 Centimeter Wavelength. *N. Gopalsamy, S. M. White, & M. R. Kundu.* 379, 366, 167-E9 (1991)
- GORDON, M. A. Detection of CO Emission in the Elliptical Galaxies NGC 3265 and NGC 5666. *M. A. Gordon.* 371, 563, 68-E1 (1991)
- GORENSTEIN, M. V. New Model for the 0957+561 Gravitational Lens System: Bounds on Masses of a Possible Black Hole and Dark Matter and Prospects for Estimation of  $H_0$ . *E. E. Falco, M. V. Gorenstein, & I. I. Shapiro.* 372, 364, 80-D1 (1991)
- First- and Second-Epoch VLBI Observations of the Gravitational Lens System 2016+112. *M. B. Heflin, M. V. Gorenstein, C. R. Lawrence, & B. F. Burke.* 378, 519, 158-G9 (1991)
- GÓRSKI, KRZYSZTOF M. Will COBE Challenge the Inflationary Paradigm? Cosmic Microwave Background Anisotropies versus Large-Scale Streaming Motions Revisited. *Krzysztof M. Górski.* 370, L5, 53-B7 (1991)
- GOSS, W. M. NGC 7538 IRS 1: Subarcsecond Resolution Recombination Line and  $^{15}\text{NH}_3$  Maser Observations. *R. A. Gaume, K. J. Johnston, H. A. Nguyen, T. L. Wilson, H. R. Dickel, W. M. Goss, & M. C. H. Wright.* 376, 608, 133-G12 (1991)
- The Radio Recovery of SN 1970G in M101. *John J. Cowan, W. M. Goss, & R. A. Sramek.* 379, L49, 175-B5 (1991)
- Deep VLA Images of Globular Clusters. *Helen M. Johnston, Shrinivas R. Kulkarni, & W. M. Goss.* 382, L89, 211-D11 (1991)
- GOSS, W. MILLER. VLA Observations of 21 Centimeter H I Absorption toward Cassiopeia A. *John H. Bieging, W. Miller Goss, & Eric M. Wilcots.* 75, 999, 16-F5 (1991)
- GOSWAMI, J. N. Ionization States of the Anomalous Cosmic Rays. *R. K. Singh, Banashree Mitra, N. Durgaprasad, S. Biswas, M. N. Vahia, J. S. Yadav, A. Dutta, & J. N. Goswami.* 374, 753, 108-D7 (1991)
- GOTT, J. RICHARD, III. Northern Dwarf and Low Surface Brightness Galaxies. IV. The Large-Scale Space Distribution. *Trinh X. Thuan, Jean-Michel Alimi, J. Richard Gott III, & Stephen E. Schneider.* 370, 25, 47-D1 (1991)
- Dynamical Evolution of Topology of Large-Scale Structure. *Changbom Park & J. Richard Gott III.* 378, 457, 158-B1 (1991)
- The Three-Point Correlation Function for Abell Clusters: Observations and Simulations. *J. Richard Gott III, Bin Gao, & Changbom Park.* 383, 90, 213-B10 (1991)
- GOTTHELF, ERIC. High-Speed Photometry of V404 Cygni in Outburst. *Eric Gottheff, Joseph Patterson, & Richard J. Stover.* 374, 340, 102-C11 (1991)
- GOTTLIEB, C. A. The Millimeter-Wave Spectrum of Highly vibrationally Excited SiO. *R. Mollaaghatababa, C. A. Gottlieb, J. M. Vrilek, & P. Thaddeus.* 368, L19, 28-D1 (1991)
- Astronomical Detection of  $\text{H}_2\text{CCC}$ . *J. Cernicharo, C. A. Gottlieb, M. Guélin, T. C. Killian, G. Paubert, P. Thaddeus, & J. M. Vrilek.* 368, L39, 35-C7 (1991)

- Astronomical Detection of H<sub>2</sub>CCCC. *J. Cernicharo, C. A. Gottlieb, M. Guellin, T. C. Killian, P. Thaddeus, & J. M. Vrtilek.* 368, L43, 35-C11 (1991)
- GOUDA, NAOITERU. Constraints on Open Universe Models from Quadrupole Anisotropy of the Cosmic Microwave Background. *Naoiteru Gouda, Naoshi Sugiyama, & Misao Sasaki.* 372, L49, 85-B1 (1991)
- Anisotropies of the Cosmic Background Radiation by Domain Wall Networks. *Yasusada Nambu, Hideki Ishihara, Naoiteru Gouda, & Naoshi Sugiyama.* 373, L35, 97-A11 (1991)
- GOUGH, D. O. The Depth of the Solar Convection Zone. *J. Christensen-Dalsgaard, D. O. Gough, & M. J. Thompson.* 378, 413, 156-B4 (1991)
- GOUGH, DOUGLAS. Nonlinear Behavior of Solar Gravity Modes Driven by <sup>3</sup>He in the Core. II. Numerical Simulations. *William J. Merryfield, Juri Toomre, & Douglas Gough.* 367, 658, 21-D8 (1991)
- Simulation of Effects of Atmospheric Seeing on the Observation of High-Degree Solar Oscillations. *Frank Hill, Douglas Gough, William J. Merryfield, & Juri Toomre.* 369, 237, 38-G7 (1991)
- GOULD, ANDREW. Gravitational Diffusion of Solar System WIMPs. *Andrew Gould.* 368, 610, 32-F7 (1991)
- Does the Solar Interior Rotate Rigidly? *Andrew Gould.* 377, 707, 148-D7 (1991)
- Binaries in a Medium of Fast Low-Mass Objects. *Andrew Gould.* 379, 280, 166-E1 (1991)
- GOULD, ROBERT J. The Energies and Structure of X-Ray K-Absorption Edges. *Robert J. Gould & Young-Dae Jung.* 373, 271, 89-D1 (1991)
- GOVERNATO, FABIO. A Long-lasting Compact Group. *Fabio Governato, Rajiv Bhatia, & Guido Chincarini.* 371, L15, 66-C1 (1991)
- GRACE, EDMUND. The Connection between Coronal Bright Points and the Variability of the Quiet-Sun Extreme-Ultraviolet Emission. *Shadia Rifai Habbal & Edmund Grace.* 382, 667, 209-G11 (1991)
- GRADY, C. A. A Search for Circumstellar Dust around HR 10, a Proposed  $\beta$  Pictoris Star. *Kwang-Ping Cheng, C. A. Grady, & Frederick C. Bruhweiler.* 366, L87, 11-E7 (1991)
- The Circumstellar Disks of  $\beta$  Pictoris Analogs. *C. A. Grady, Frederick C. Bruhweiler, K. P. Cheng, W. A. Chiu, & Y. Kondo.* 367, 296, 15-F9 (1991)
- Circumstellar Material around  $\lambda$  Eridani (B2e). I. Geometry and Kinematics during 1987-1988. *Myron A. Smith, Geraldine J. Peters, & C. A. Grady.* 367, 302, 15-G1 (1991)
- Mass Outflow in the Nearby Proto-Planetary System  $\beta$  Pictoris. *Frederick C. Bruhweiler, Yoji Kondo, & C. A. Grady.* 371, L27, 66-D7 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Resolved Velocity and Density Structure in the  $\beta$  Pictoris Circumstellar Gas. *A. Boggess, Frederick C. Bruhweiler, C. A. Grady, Dennis C. Ebbets, Yoji Kondo, L. M. Trafton, John C. Brandt, & S. R. Heap.* 377, L49, 143-F1 (1991)
- GRAF, U. U. First Observations of the CO J = 6-5 Transition in Starburst Galaxies. *A. I. Harris, R. E. Hills, J. Stutzki, U. U. Graf, A. P. G. Russell, & R. Genzel.* 382, L75, 211-C7 (1991)
- GRAHAM, J. R. Discovery of an Infrared Nucleus in Cygnus A: An Obscured Quasar Revealed? *S. Djorgovski, N. Weir, K. Matthews, & J. R. Graham.* 372, L67, 85-C5 (1991)
- See SOIFER, B. T., et al. Near-Infrared Observations of the z ~ 2.3 IRAS Source FSC 10214+4724.
- GRAHAM, JAMES R. The H<sub>2</sub> Line Profiles in the Cygnus Loop: Evidence for J-Shocks with Magnetic Precursors. *James R. Graham, Gillian S. Wright, & T. R. Geballe.* 372, L21, 79-C7 (1991)
- GRAMANN, MIRT. Phase Shifts in Gravitationally Evolving Density Fields. *Barbara S. Ryden & Mirt Gramann.* 383, L33, 226-B1 (1991)
- GRANDI, STEVEN A. 3C 390.3: Modeling Variable Profile Humps. *Wei Zheng, Sylvain Veilleux, & Steven A. Grandi.* 381, 418, 196-A1 (1991)
- GRANEY, CHRISTOPHER M. Optical Coronal Emission Lines from Cooling Flows in Elliptical Galaxies and Galaxy Clusters. *Craig L. Sarazin & Christopher M. Graney.* 375, 532, 119-D3 (1991)
- GRASER, U. See GIOMMI, P., et al. The EXOSAT High Galactic Latitude Survey.
- GRAUER, A. D. See WINGER, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- Discovery and Seismological Interpretation of Low-Amplitude Modes in the Pulsating DO White Dwarf PG 1707+427 (V817 Herculis). *G. Fontaine, P. Bergeron, G. Vauchier, P. Brassard, E. Wesemael, S. D. Kawaler, A. D. Grauer, & D. E. Winget.* 378, L49, 162-F1 (1991)
- GREBENEV, S. See BOUCHET, L., et al. SIGMA Discovery of Variable e<sup>+</sup>-e<sup>-</sup> Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7-2942.
- See SUNYAEV, R., et al. Three Spectral States of 1E 1740.7-2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature.
- GREEN, K. D. See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- GREEN, PAUL J. Three Newly Recognized Dwarf Carbon Stars. *Paul J. Green, Bruce Margon, & D. Jack MacConnell.* 380, L31, 181-E1 (1991)
- GREEN, R. F. Quasars and Active Galactic Nuclei in Rich Environments. II. The Evolution of Radio-loud Quasars. *E. Ellingson, H. K. C. Yee, & R. F. Green.* 371, 49, 60-F7 (1991)
- Quasars and Active Galactic Nuclei in Rich Environments. I. Fields Surrounding Optically Faint Quasars. *E. Ellingson, H. K. C. Yee, & R. F. Green.* 76, 455, 31-D2 (1991)
- Clusters of Galaxies Associated with Quasars. II. Galaxy Cluster Dynamics. *E. Ellingson, R. F. Green, & H. K. C. Yee.* 378, 476, 158-D1 (1991)
- GREEN, RICHARD F. Limits on the Space Density of Double Degenerates as Type Ia Supernova Progenitors. *Diana Foss, Richard A. Wade, & Richard F. Green.* 374, 281, 101-E9 (1991)
- Discovery of a Ly $\alpha$  Galaxy near a Damped Ly $\alpha$  Absorber at z = 2.3. *James D. Lowenthal, Craig J. Hogan, Richard F. Green, Adeline Caulet, Bruce E. Woodgate, Larry Brown, & Craig B. Foltz.* 377, L73, 150-C1 (1991)
- GREEN, SHELDON. Collisional Excitation of Formaldehyde in "Hot" Interstellar Molecular Regions. *Sheldon Green.* 76, 979, 38-E3 (1991)
- GREENFIELD, P. See MACCHETTO, F., et al. First Results from the Faint Object Camera: Observations of PKS 0521-36.
- See CRANE, P., et al. First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305.
- See JAKOBSEN, P., et al. First Results from the Faint Object Camera: SN 1987A.
- See PARESCE, F., et al. First Results from the Faint Object Camera: Imaging the Core of R Aquarii.
- See MACCHETTO, F., et al. HST Observations of 3C 66B: A Double-stranded Optical Jet.
- See ALBRECHT, R., et al. First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System.
- See WEIGELT, G., et al. First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.
- GREENHOUSE, MATTHEW A. Near-Infrared [Fe II] Emission of M82 Supernova Remnants: Implications for Tracing the Supernova Content of Galaxies. *Matthew A. Greenhouse, Charles E. Woodward, Harley A. Thronson, Jr., Richard J. Rudy, George S. Rossano, Peter Erwin, & R. C. Puett.* 383, 164, 214-B1 (1991)
- GREGORY, BROOKE. Near-Infrared Long-Slit Spectroscopy of IRAS 14348-1447. *Tadashi Nakajima, Kimiaki Kawara, Minoru Nishida, & Brooke Gregory.* 373, 452, 93-E6 (1991)
- GREGORY, P. C. The 87GB Catalog of Radio Sources Covering 0° < δ < +75° at 4.85 GHz. *P. C. Gregory & J. J. Condon.* 75, 1011, 17-A1 (1991)
- GRESH, D. L. See KRISHER, T. P., et al. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of Voyager 2.
- GRIEST, KIM. Galactic Microlensing as a Method of Detecting Massive Compact Halo Objects. *Kim Griest.* 366, 412, 8-A5 (1991)
- Window for the Dark Matter Solution to the Solar Neutrino Problem. *David Dearborn, Kim Griest, & Georg Raffelt.* 368, 626, 33-A1 (1991)

- Gravitational Microlensing as a Method of Detecting Disk Dark Matter and Faint Disk Stars.** *Kim Griest, Charles Alcock, Timothy S. Axelrod, David P. Bennett, Kem H. Cook, Kenneth C. Freeman, Hye-Sook Park, Saul Perlmutter, Bruce A. Peterson, Peter J. Quinn, Alexander W. Rodgers, & Christopher W. Stubbs (The MACHO Collaboration).* 372, L79, 85-D5 (1991)
- GRIPPITH, MARK.** The Fourth MIT-Green Bank 5 GHz Survey. *Mark Griffith, Glen Langston, Mike Heflin, Sam Conner, & Bernard Burke.* 75, 801, 12-C5 (1991)
- GRIFFITHS, RICHARD E.** Search for Starbursts among X-Ray-selected Galaxies: Optical Spectroscopy. *Antonella Fruscione & Richard E. Griffiths.* 380, L13, 181-C1 (1991)
- GRIGOROV, N. L.** See ADAMS, J. H., JR., et al. The Charge State of the Anomalous Component of Cosmic Rays.
- GRIGSBY, JAMES A.** A Non-Local Thermodynamic Equilibrium, Line-blanketed Synthetic Spectrum of Iota Herculis: C, Al, and Si Lines. *James A. Grigsby.* 380, 606, 185-F9 (1991)
- GROISMAN, G.** Analysis and Solution of the Light and Radial Velocity Curves of the Contact Binary TY Bootis. *E. F. Milone, G. Groisman, D. J. I. Fry, & D. H. Bradstreet.* 370, 677, 56-G5 (1991)
- GROOM, D. E.** Mayflower Mine 1500 GV Detector: Cosmic-Ray Anisotropy and Search for Cygnus X-3. *D. J. Cutler & D. E. Groom.* 376, 322, 128-G12 (1991)
- GROTH, EDWARD J.** See LYNDS, ROGER, et al. NGC 1068: Resolution of Nuclear Structure in the Optical Continuum.
- See HOLTZMAN, JON A., et al. Stellar Photometry with the *Hubble Space Telescope* Wide-Field/Planetary Camera: A Progress Report.
- See LAUER, TOD R., et al. The Core of the Nearby S0 Galaxy NGC 7457 Imaged with the *HST* Planetary Camera.
- See LAUER, TOD R., et al. The Postcollapse Core of M15 Imaged with the *HST* Planetary Camera.
- See WESTPHAL, JAMES A., et al. *Hubble Space Telescope* Wide-Field/Planetary Camera Images of Saturn.
- See HESTER, J. JEFF, et al. Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0''.1.
- GROTH, H. G.** Echelle Spectroscopy of CD -41° 13967: The Young Central Star of a New Planetary Nebula. *James K. McCarthy, R. Michael Rich, S. R. Becker, K. Butler, D. Husfeld, & H. G. Groth.* 371, 380, 64-G1 (1991)
- GROVE, J. E.** The  $^{54}\text{Mn}$  Clock and Its Implications for Cosmic-Ray Propagation and Fe Isotope Studies. *J. E. Grove, B. T. Hayes, R. A. Mewaldt, & W. R. Webber.* 377, 680, 148-B3 (1991)
- GRUBER, D. E.** A Model for the 35 Day Variations in the Pulse Profile of Hercules X-1. *J. A. Peterson, R. E. Rothschild, & D. E. Gruber.* 378, 696, 161-A11 (1991)
- GRUBER, DUANE.** X-Ray Emission from Starburst Galaxies. *Yoel Rephaeli, Duane Gruber, Massimo Persic, & Dan MacDonald.* 380, L59, 188-C1 (1991)
- GRUENWALD, R. B.** The Origin of the Quasi-stellar Object Absorption Lines. *S. M. Viegas & R. B. Gruenwald.* 377, 39, 138-E5 (1991)
- GRUNDETH, B.** Superbubble Blowout in the Giant H II Region NGC 2363? *Jean-René Roy, J. Boulesteix, Gilles Joncas, & B. Grundseth.* 367, 141, 13-F8 (1991)
- GRUNSFELD, JOHN M.** Coded-Aperture Imaging of the Galactic Center Region at Gamma-Ray Energies. *Walter R. Cook, John M. Grunsfeld, William A. Heindl, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone.* 372, L75, 85-D1 (1991)
- Energy Spectra and Composition of Primary Cosmic Rays. *Dietrich Müller, Simon P. Swordy, Peter Meyer, Jacques L'Heureux, & John M. Grunsfeld.* 374, 356, 102-E1 (1991)
- GRY, C.** Studies of H I and D I in the Local Interstellar Medium: Erratum. *J. Murthy, R. C. Henry, H. W. Moos, A. Vidal-Madjar, J. L. Link, & C. Gry.* 378, 455, 156-E8 (1991) (Orig. paper in 356, 223, 101-G5 (1990))
- GUARINI, G.** High-Latitude Galactic Emission and the Search for Anisotropies of the Cosmic Background Radiation. *S. Masi, P. de Bernardis, M. De Petris, M. Epifani, M. Gervasi, & G. Guarini.* 366, L51, 11-B1 (1991)
- GUDEHUS, DONALD H.** Systematic Bias in Cluster Galaxy Data, Affecting Galaxy Distances and Evolutionary History. *Donald H. Gudehus.* 382, 1, 200-A13 (1991)
- GUÉLIN, M.** Astronomical Detection of H<sub>2</sub>CCC. *J. Cernicharo, C. A. Gottlieb, M. Guélin, T. C. Killian, G. Pauvert, P. Thaddeus, & J. M. Vrtilek.* 368, L39, 35-C7 (1991)
- Astronomical Detection of H<sub>2</sub>CCCC. *J. Cernicharo, C. A. Gottlieb, M. Guélin, T. C. Killian, P. Thaddeus, & J. M. Vrtilek.* 368, L43, 35-C11 (1991)
- GUENTHER, D. B.** High Sensitivity of p-Modes near the Acoustic Cutoff Frequency to Solar Model Parameters. *D. B. Guenther.* 369, 247, 39-A5 (1991)
- The p-Mode Oscillation Spectra of an Evolving 1 M $\odot$  Sun-like Star. *D. B. Guenther.* 375, 352, 115-C8 (1991)
- The Effect of the Mihalas, Hummer, and Däppen Equation of State and the Molecular Opacity on the Standard Solar Model. *Y.-C. Kim, P. Demarque, & D. B. Guenther.* 378, 407, 156-A10 (1991)
- GÜNTHER, EIKE.** An Optical/Infrared Outburst in the Exciting Source of HH 7-11. *Jochen Eisloffel, Eike Günther, Frederic V Hessman, Reinhard Mundt, Ralf Poetzl, John S. Carr, Steven Beckwith, & Tom P. Ray.* 383, L19, 219-C7 (1991)
- GUESSOUUM, NIDHAL.** Positron Annihilation in the Interstellar Medium. *Nidhal Guessouum, Reuven Ramaty, & Richard E. Lingensfelter.* 378, 170, 153-B4 (1991)
- GÜSTEN, ROLF.** CS Multitransitional Studies of Density Distribution in Star-forming Regions. I. The NGC 2071 Region. *Shudong Zhou, Neal J. Evans II, Rolf Güsten, Lee G. Mundy, & Marc L. Kutner.* 372, 518, 82-C1 (1991)
- GUHATHAKURTA, P.** On the Population of H I Dwarf Galaxies. *David H. Weinberg, Arpad Szomoru, P. Guhathakurta, & J. H. van Gorkom.* 372, L13, 79-B11 (1991)
- The Clustering of Faint Galaxies. *G. Efstathiou, G. Bernstein, N. Katz, J. A. Tyson, & P. Guhathakurta.* 380, L47, 188-B1 (1991)
- GUILLOTEAU, S.** Anatomy of the Barnard 5 Core. *G. A. Fuller, P. C. Myers, W. J. Welch, P. F. Goldsmith, W. D. Langer, B. G. Campbell, S. Guilloteau, & R. W. Wilson.* 376, 135, 126-E10 (1991)
- GUINAN, EDWARD F.** Interpreting Epsilon Aurigae. *Sean M. Carroll, Edward F. Guinan, George P. McCook, & Robert A. Donahue.* 367, 278, 15-E1 (1991)
- GULKIS, S.** See SMOOT, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- See WANNIER, P. G., et al. Water in Dense Molecular Clouds.
- See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a 7° Beam by the *Cosmic Background Explorer* (COBE).
- GULL, T. R.** See FELDMAN, P. D., et al. Observations of Comet Levy (1990c) with the Hopkins Ultraviolet Telescope.
- GULL, THEODORE R.** A Large Supershell H II Region Complex in the Large Magellanic Cloud and the Interstellar Environment of SN 1987A. *Frederick C. Bruhweiler, Michelle A. Fitzurka, & Theodore R. Gull.* 370, 551, 55-C9 (1991)
- See BLAIR, WILLIAM P., et al. Discovery of a Fast Radiative Shock Wave in the Cygnus Loop Using the Hopkins Ultraviolet Telescope.
- GULLIVER, AUSTIN F.** Metallic Line Profiles of the A0 V Star Vega. *Austin F. Gulliver, Saul J. Adelman, Charles R. Cowley, & J. Murray Fletcher.* 380, 223, 178-G1 (1991)
- GUNN, JAMES E.** Spectra of Two Very Old Supernovae: SN 1986J and SN 1980K. *Bruno Leibundgut, Robert P. Kirshner, Philip A. Pinto, Michael P. Rupen, R. Chris Smith, James E. Gunn, & Donald P. Schneider.* 372, 531, 82-D1 (1991)
- Dissipational Galaxy Formation. I. Effects of Gasdynamics. *Neal Katz & James E. Gunn.* 377, 365, 144-D1 (1991)
- GURZADYAN, G. A.** A Cool Supergiant with Anomalous Behavior of the 2800 Mg II Doublet. *G. A. Gurzadyan, Y. Kondo, S. S. Rustambekyan, Yervant Terzian, & Mario R. Perez.* 378, 298, 154-F1 (1991)
- GUTIÉRREZ-MORENO, A.** Two Planetary Nebulae in the Direction of the Galactic Center. *A. Gutiérrez-Moreno, H. Moreno, & G. Cortés.* 383, 174, 214-C1 (1991)
- GUZIK, JOYCE A.** Effects of Opacity and Equation of State on Solar Structure and Oscillations. *Joyce A. Guzik & Arthur N. Cox.* 381, 333, 193-B5 (1991)

- GUZZO, LUIGI. Scale-invariant Clustering in the Large-Scale Distribution of Galaxies. *Luigi Guzzo, Angela Iovino, Guido Chincarini, Riccardo Giovanelli, & Martha P. Hayes.* 382, L5, 205-B1 (1991)
- GWINN, C. R. The Galactic Center Radio Source Shines below the Compton Limit. *C. R. Gwinne, R. M. Danen, J. Middlelitch, L. M. Ozernoy, & T. Kh. Tran.* 381, L43, 199-B7 (1991)
- GYULBUDAGHIAN, ARMEN L. A Search for Embedded Young Stellar Objects in and near the IC 1396 Complex. *Richard D. Schwartz, Armen L. Gyulbudaghian, & Bruce A. Wilking.* 370, 263, 50-D9 (1991)
- HAARDT, F. A Two-Phase Model for the X-Ray Emission from Seyfert Galaxies. *F. Haardt & L. Maraschi.* 380, L51, 188-B6 (1991)
- HAAS, M. R. Axisymmetric Model of the Ionized Gas in the Orion Nebula. *R. H. Rubin, J. P. Simpson, M. R. Haas, & E. F. Erickson.* 374, 564, 106-B12 (1991)
- HAAS, MICHAEL R. Far-Infrared Line and Continuum Observations of G0.095+0.012 and the E2 Thermal Radio Filament near the Galactic Center. *Edwin F. Erickson, Sean W. J. Colgan, J. P. Simpson, Robert H. Rubin, Mark Morris, & Michael R. Haas.* 370, L69, 59-C1 (1991)
- Observations of [Si II] (35 Micron) and [S I] (25 Micron) in Orion: Evidence for a Wind Shock near IRC2. *Michael R. Haas, David Hollenbach, & Edwin F. Erickson.* 374, 555, 106-B1 (1991)
- HABRAL, SHADIA RIFAI. High-Resolution Studies of the Structure of the Solar Atmosphere Using a New Imaging Algorithm. *Margarita Karovska & Shadia Rifai Habbal.* 371, 402, 65-31 (1991)
- First Observations of Macrospicules at 4.8 GHz at the Solar Limb in Polar Coronal Holes. *Shadia Rifai Habbal & Raymond D. Gonzalez.* 376, L25, 130-D1 (1991)
- The Connection between Coronal Bright Points and the Variability of the Quiet-Sun Extreme-Ultraviolet Emission. *Shadia Rifai Habbal & Edmund Grace.* 382, 667, 209-G11 (1991)
- HABELL, F. The X-Ray Properties of GX 301-2 (4U 1223-62). *F. Habell.* 376, 245, 128-A5 (1991)
- HACHISU, IZUMI. Rayleigh-Taylor Instabilities and Mixing in the Helium Star Models for Type Ib/Ic Supernovae. *Izumi Hachisu, Takuya Matsuda, Kenichi Nomoto, & Toshikazu Shigeyama.* 368, L27, 35-B4 (1991)
- Is Drag Luminosity Effective in Recurrent Novae? *Mariko Kato & Izumi Hachisu.* 373, 620, 95-F1 (1991)
- Effects of Drag Luminosity in the Common Envelope Phase of Slow Novae. *Mariko Kato & Izumi Hachisu.* 383, 761, 223-F3 (1991)
- HACKING, P. B. The Number Counts and Infrared Backgrounds from Infrared-bright Galaxies. *P. B. Hacking & B. T. Soifer.* 367, L49, 22-B7 (1991)
- HACKWELL, JOHN A. Observations That Link Infrared Cirrus and Ultraviolet Extinction. *John A. Hackwell, James H. Hecht, & Mauricio Tapia.* 375, 163, 113-A9 (1991)
- HADJIOPOULOS, A. A. Models of White Dwarfs under Rapid Uniform or Differential Rotation: Numerical Results. II. *V. S. Geroyannis & A. A. Hadjopoulos.* 75, 499, 7-D11 (1991)
- HAEHNELT, M. See QUIRRENBACH, A., et al. Correlated Radio and Optical Variability in the BL Lacertae Object 0716+714.
- HAENSEL, P. Gamma-Ray Bursts from Colliding Strange Stars. *P. Haensel, B. Paczyński, & P. Amsterdamski.* 375, 209, 113-E10 (1991)
- HAGGERTY, M. A Survey of the 158 Micron [C II] Fine-Structure Line in the Central 50 Parsecs of the Galaxy. *A. Poglitsch, G. J. Stacey, N. Geis, M. Haggerty, J. Jackson, M. Rumitz, R. Genzel, & C. H. Townes.* 374, L33, 110-B5 (1991)
- HAINES, T. J. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- HAISCH, BERNHARD. The Coronal Dividing Line in the ROSAT X-Ray All-Sky Survey. *Bernhard Haisch, J. H. M. M. Schmitt, & C. Rosso.* 383, L15, 219-C1 (1991)
- HAIVASSILIOU, CHRIS A. On the Cosmological Significance of the Apparent Deficit of Small Interplanetary Scintillation Sources. *Chris A. Hajivassiliou.* 381, 3, 189-A13 (1991)
- HALL, DOUGLAS S. The Extraordinary 1989 December 14/15 Optical Flare Events on V711 Tauri. *Gregory W. Henry & Douglas S. Hall.* 373, L9, 91-B7 (1991)
- Mass Loss in the 96 Day Binary UU Cancri. *Joel A. Eaton, Douglas S. Hall, & R. Kent Honeycutt.* 376, 289, 128-E1 (1991)
- A Connection between Long-Term Luminosity Variations and Orbital Period Changes in Chromospherically Active Binaries. *Douglas S. Hall.* 380, L85, 188-F1 (1991)
- HALL, P. J. See MOULD, J. R., et al. The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. I. Southern Clusters.
- HALLAM, K. L. Rotational Modulation in IUE Spectra of Cool Dwarf Chromospheres. I. Data Analysis and Period Search Techniques. *K. L. Hallam, B. Altner, & A. S. Endal.* 372, 610, 83-C1 (1991)
- HALPERN, J. P. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- HALPERN, JULES. A Search for Periodicities in the X-Ray Emission from Cataclysmic Variables. *Michael Eracleous, Joseph Patterson, & Jules Halpern.* 370, 330, 51-D1 (1991)
- X-Ray Spectra of Cataclysmic Variables from the Einstein Observatory. *Michael Eracleous, Jules Halpern, & Joseph Patterson.* 382, 290, 203-G1 (1991)
- HALPERN, JULES P. The Ultraviolet Spectrum and Continuum Energy Distribution of the Bright Quasar H1821+643. *Michiel Kolman, Jules P. Halpern, Chris R. Shrader, & Alexei V. Filippenko.* 373, 57, 86-F8 (1991)
- HAMANN, WOLF-RAINER. Non-LTE Analysis of the Ofpe/WN9 Star HDE 269227 (R84). *Werner Schmutz, Claus Leitherer, Ivan Hubeny, Manfred Vogel, Wolf-Rainer Hamann, & Ulf Wesselowsky.* 372, 664, 84-A1 (1991)
- HAMILTON, A. J. S. HEAO 1 A-2 Low-Energy Detector X-Ray Spectra of the Lupus Loop and SN 1006. *D. A. Leahy, J. Nousek, & A. J. S. Hamilton.* 374, 218, 100-G1 (1991)
- Reconstructing the Primordial Spectrum of Fluctuations of the Universe from the Observed Nonlinear Clustering of Galaxies. *A. J. S. Hamilton, P. Kumar, Edward Lu, & Alex Matthews.* 374, L1, 103-B7 (1991)
- HAMILTON, DONALD. Spectroscopy of Taurus Cloud Brown Dwarf Candidates. *John Stauffer, Terry Herter, Donald Hamilton, George H. Rieke, Marcia J. Rieke, Ron Probst, & William Forrest.* 367, L23, 17-D7 (1991)
- HAMILTON, RUSSELL J. Avalanches and the Distribution of Solar Flares. *Edward T. Lu & Russell J. Hamilton.* 380, L89, 188-F5 (1991)
- HAMILTON, T. The Detection of X-Rays from the Hot Interstellar Medium of the Large Magellanic Cloud. *Q. Wang, T. Hamilton, D. J. Helfand, & X. Wu.* 374, 475, 105-A10 (1991)
- The Intensity and Spectrum of the Diffuse X-Ray Background. *X. Wu, T. Hamilton, D. J. Helfand, & Q. Wang.* 379, 564, 171-F1 (1991)
- HAMILTON, T. T. Faint X-Ray Source Counts and the Origin of the X-Ray Background. *T. T. Hamilton, D. J. Helfand, & X. Wu.* 379, 576, 171-G1 (1991)
- HAMMER, F. Deep Spectroscopy under High Spatial Resolution of the High-Redshift Radio Source 3CR 368: The Monster Elucidated. *F. Hammer, O. Le Feuvre, & D. Proust.* 374, 91, 99-B7 (1991)
- Thin and Giant Luminous Arcs: A Strong Test of the Lensing Cluster Mass Distribution. *F. Hammer.* 383, 66, 212-G8 (1991)
- HAMUY, M. Multiwavelength Observations of Nova LMC 1990 Number 2: The First Extragalactic Recurrent Nova. *Steven N. Shore, George Sonneborn, Sumner G. Starrfield, M. Hamuy, R. E. Williams, A. Cassatella, & H. Drechsel.* 370, 193, 49-E8 (1991)
- The Evolution and Classification of Postoutburst Novae Spectra. *R. E. Williams, M. Hamuy, M. M. Phillips, S. R. Heathcote, Lisa Wells, & M. Navarrete.* 376, 721, 135-C7 (1991)
- HAN, MING SHENG. See MOULD, J. R., et al. The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. I. Southern Clusters.
- HANAMI, H. Numerical Study of Compressible Solar Magnetoconvection with an Open Transitional Boundary. *H. Hanami & T. Tajima.* 377, 694, 148-C6 (1991)
- HANAWA, TOMOYUKI. Monte Carlo Simulation of Comptonization in Plasma Accreting onto Neutron Stars. *Tomoyuki Hanawa.* 366, 495, 9-B9 (1991)

- Application of a General Relativistic Accretion Disk Model to LMC X-1, LMC X-3, X1608-522, and X1636-536. *Ken Ebisawa, Kazuhisa Mitsuda, & Tomoyuki Hanawa.* 367, 213, 14-F8 (1991)
- High-Energy X-Ray Production in a Boundary Layer of an Accreting Neutron Star. *Tomoyuki Hanawa.* 373, 222, 88-F9 (1991)
- HANCOCK, TERRY J. Constraints on the Companion Object to HD 114762. *William D. Cochran, Arlie P. Hatzes, & Terry J. Hancock.* 380, L35, 181-E6 (1991)
- HANIFF, C. A. The Starburst Ring around the Seyfert Nucleus in NGC 7469. *A. S. Wilson, T. T. Helfer, C. A. Haniff, & M. J. Ward.* 381, 79, 190-A6 (1991)
- HANIFF, CHRISTOPHER A. High-Excitation Extranuclear Gas in Seyfert Galaxies. *Christopher A. Haniff, Martin J. Ward, & Andrew S. Wilson.* 368, 167, 25-B5 (1991)
- HANKINS, T. H. Does the Vela Pulsar Have "Wisps"? *M. F. Bietenholz, D. A. Frail, & T. H. Hankins.* 376, L41, 137-C1 (1991)
- H I Absorption Measurements toward 15 Pulsars and the Radial Distribution of Diffuse Ionized Gas in the Galaxy. *D. A. Frail, J. M. Cordes, T. H. Hankins, & J. M. Weisberg.* 382, 168, 202-C10 (1991)
- HANKINS, TIMOTHY H. Microstructure-determined Pulsar Dispersion Measures and the Problem of Profile Alignment. *Timothy H. Hankins, Vera A. Izvekova, Valerii M. Malofeev, Joanna M. Rankin, Yuri P. Shitov, & Daniel R. Stinebring.* 373, L17, 91-C1 (1991)
- HANSEN, C. J. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- HARDEE, PHILIP E. Atmospheric Gradients and the Stability of Expanding Jets. *Philip E. Hardee, Michael L. Norman, Theodoros Kouvelis, & David A. Clarke.* 373, 8, 86-B10 (1991)
- HARDING, A. K. Cosmic-Ray Transport and Gamma-Ray Emission in Supernova Shells. *A. K. Harding, A. Mastichiadis, R. J. Protheroe, & A. P. Szabo.* 378, 163, 153-A9 (1991)
- HARDING, ALICE K. Cyclotron Resonant Scattering and Absorption. *Alice K. Harding & Joseph K. Daugherty.* 374, 687, 107-E8 (1991)
- HARKNESS, ROBERT P. Model Light Curves of Linear Type II Supernovae. *Douglas A. Swartz, J. Craig Wheeler, & Robert P. Harkness.* 374, 266, 101-D7 (1991)
- HARLESTON, HUGH. Numerical Solution of the General Relativistic Boltzmann Equation for Massive and Massless Particles. *Hugh Harleston & Katherine A. Holcomb.* 372, 225, 76-F13 (1991)
- HARNDEN, F. R., JR. The Diffuse Soft X-Ray Background As Seen with the Einstein Observatory. *G. Micela, F. R. Harnden, Jr., R. Rosner, S. Sciorino, & G. S. Vaiana.* 380, 495, 184-D1 (1991)
- HARPAZ, AMOS. Stability of a Collapsed Star in Bimetric General Relativity. II. *Amos Harpa & Nathan Rosen.* 371, 254, 63-C9 (1991)
- Evolution of Compact Binary Systems with X-Ray Heating. *Amos Harpa & Saul Rappaport.* 383, 739, 223-D3 (1991)
- HARPER, D. A. Far-Infrared and Submillimeter Wavelength Observations of Star-forming Dense Cores. II. Images. *E. F. Ladd, Fred C. Adams, S. Casey, J. A. Davidson, G. A. Fuller, D. A. Harper, P. C. Myers, & R. Padman.* 382, 555, 208-D7 (1991)
- HARRA, L. K. Improved Line Ratio Calculations Involving  $\Delta n = 1$  (2-3) Transitions in O V and a Reanalysis of Skylab Observations of Solar Flares. *F. P. Keenan, P. L. Dufson, L. K. Harra, E. S. Conlon, K. A. Berrington, A. E. Kingston, & K. G. Widing.* 382, 349, 204-E1 (1991)
- HARRINGTON, J. PATRICK. A Grain-heated, Dusty Planetary Nebula in M22. *Kazimierz J. Borkowski & J. Patrick Harrington.* 379, 168, 165-B1 (1991)
- HARRIS, A. I. The Molecular Interstellar Medium and the Near-Infrared Continuum of the Barred LINER NGC 6764. *A. Eckart, M. Cameron, J. M. Jackson, R. Genzel, A. I. Harris, W. Wild, & H. Zinnecker.* 372, 67, 74-G9 (1991)
- First Observations of the CO  $J = 6-5$  Transition in Starburst Galaxies. *A. I. Harris, R. E. Hills, J. Stutzki, U. U. Graf, A. P. G. Russell, & R. Genzel.* 382, L75, 211-C7 (1991)
- HARRIS, ANDREW I. The Interstellar Medium of the Hot-Spot Galaxy NGC 2903. *James M. Jackson, Andreas Eckart, Murray Cameron, Wolfgang Wild, Paul T. P. Ho, Richard W. Pogge, & Andrew I. Harris.* 375, 105, 112-C9 (1991)
- HARRIS, D. E. An X-Ray and Radio Study of Steep-Spectrum Radio Sources. II. Four Fields from a 22 MHz Polar Cap Survey. *P. E. Dewdney, C. H. Costain, J. McHardy, A. G. Willis, D. E. Harris, & C. P. Stern.* 36, 1055, 40-D1 (1991)
- HARRIS, I. What Maintains the Zonal Circulation in Planetary Atmospheres? *H. G. Mayr, K. L. Chan, I. Harris, & K. Schatten.* 367, 361, 16-E1 (1991)
- HARRIS, K. See AKERLOF, C. W., et al. Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy.
- HARRIS, MICHAEL J. A Search for the 478 keV Line from the Decay of Nucleosynthetic  $^7\text{Be}$ . *Michael J. Harris, Mark D. Leising, & Gerald H. Share.* 375, 216, 113-F5 (1991)
- A Search for the 2.223 MeV Neutron Capture Gamma-Ray Line from the Directions of Cygnus and the Galactic Center. *Michael J. Harris & Gerald H. Share.* 381, 439, 196-B10 (1991)
- HARRIS, WILLIAM E. Multicolor CCD Photometry of Globular Clusters in Two Virgo Elliptical Galaxies. *Jean Couture, William E. Harris, & J. W. B. Allwright.* 372, 97, 75-C1 (1991)
- The Luminosity Distribution of Globular Clusters in Three Giant Virgo Ellipticals. *William E. Harris, J. W. B. Allwright, Christopher J. Pritchett, & Sidney van den Bergh.* 76, 115, 25-D11 (1991)
- Planetary Nebulae as Standard Candles. VII. A Test versus Hubble Type in the NGC 1023 Group. *Robin Ciardullo, George H. Jacoby, & William E. Harris.* 383, 487, 220-D1 (1991)
- HARRISON, EDWARD. Hubble Spheres and Particle Horizons. *Edward Harrison.* 383, 60, 212-G1 (1991)
- HARTIG, G. See CAGANOFF, S., et al. Faint Object Spectrograph Spectroscopy of Resolved Structure in the Nucleus of NGC 1068.
- HARTIG, G. F. The Ultraviolet Absorption Spectrum of 3C 273. *J. N. Bahcall, B. T. Jannuzzi, D. P. Schneider, G. F. Hartig, R. Bohlin, & V. Junkkarinen.* 377, L5, 143-B6 (1991)
- Faint Object Spectrograph Observations of the Low-Luminosity Seyfert Galaxy NGC 1566. *G. A. Kriss, G. F. Hartig, L. Armus, William P. Blair, S. Caganoff, & L. Dressel.* 377, L13, 143-C1 (1991)
- HARTIG, GEORGE F. See BEAVER, E. A., et al. Far-Ultraviolet Spectroscopy of the Quasar UM 675 with the Faint Object Spectrograph on the *Hubble Space Telescope*.
- HARTIGAN, PATRICK. Optical Excess Emission in T Tauri Stars. *Patrick Hartigan, Scott J. Kenyon, Lee Hartmann, Stephen E. Strom, Suzan Edwards, Alan D. Wely, & John Stauffer.* 382, 617, 209-C1 (1991)
- HARTMANN, D. H. Inhomogeneous Halo Collapse and Early Galactic Chemical Evolution: Globular Cluster Metalicities. *G. Malinie, D. H. Hartmann, & G. J. Mathews.* 376, 520, 132-G9 (1991)
- HARTMANN, DIETER H. Fuzzy Correlations of Gamma-Ray Bursts. *Dieter H. Hartmann, Eric V. Linder, & George R. Blumenthal.* 367, 186, 14-D1 (1991)
- X-Ray Echoes from Gamma-Ray Bursts. *Charles D. Dermer, Kevin C. Hurley, & Dieter H. Hartmann.* 370, 341, 51-E1 (1991)
- HARTMANN, L. W. The High State of the FU Orionis Variable Z Canis Majoris. *F. V. Hessman, J. Eisloffel, R. Mundt, L. W. Hartmann, W. Herbst, & J. Krautter.* 370, 384, 52-A10 (1991)
- HARTMANN, LEE. Optical Excess Emission in T Tauri Stars. *Patrick Hartigan, Scott J. Kenyon, Lee Hartmann, Stephen E. Strom, Suzan Edwards, Alan D. Wely, & John Stauffer.* 382, 617, 209-C1 (1991)
- On the Near-Infrared Spectrum of FU Orionis. *Nuria Calvet, Lee Hartmann, & Scott J. Kenyon.* 383, 752, 223-E6 (1991)
- HARTMANN, LEE W. See DUNCAN, DOUGLAS K., et al. Ca II H and K Measurements Made at Mount Wilson Observatory, 1966-1983. The Chromospheric Activity of Low-Mass Stars in the Hyades. *John R. Stauffer, Mark S. Giampapa, William Herbst, James M. Vincent, Lee W. Hartmann, & Robert A. Stern.* 374, 142, 99-G1 (1991)
- The Dusty Envelopes of FU Orionis Variables. *Scott J. Kenyon & Lee W. Hartmann.* 383, 664, 222-E1 (1991)
- HARTWICK, F. D. A. The Halo of the Large Magellanic Cloud: Kinematics of the CH Stars. *A. P. Cowley & F. D. A. Hartwick.* 373, 80, 87-A8 (1991)
- HARVEY, J. W. Wavelength Variation of  $p$ -Mode Intensity Fluctuations. *R. S. Ronan, J. W. Harvey, & T. L. Duvall, Jr.* 369, 549, 44-E9 (1991)
- Measurements of High-Frequency Solar Oscillation Modes. *T. L. Duvall, Jr., J. W. Harvey, S. M. Jefferies, & M. A. Pomerantz.* 373, 308, 89-G1 (1991)
- Characteristics of Intermediate-Degree Solar  $p$ -Mode Line Widths. *S. M. Jefferies, T. L. Duvall, Jr., J. W. Harvey, Y. Osaki, & M. A. Pomerantz.* 377, 330, 142-A11 (1991)

- HARVEY, K. Do Changes in the Photospheric Magnetic Network Cause the 11 Year Variation of Total Solar Irradiance? *P. Foukal, K. Harvey, & F. Hill.* 383, L89, 226-G1 (1991)
- HARVEY, P. M. The Far-Infrared Morphology of the Double-ringed Galaxy NGC 4736 (M94): A Ring Surrounding an Extended Nucleus. *Beverly J. Smith, D. F. Lester, P. M. Harvey, & R. W. Pogge.* 373, 66, 86-G5 (1991)
- The Far-Infrared Morphology of the Double-ringed Spiral Galaxy NGC 4736 (M94): A Ring Surrounding an Extended Nucleus: Erratum. *Beverly J. Smith, D. F. Lester, P. M. Harvey, & R. W. Pogge.* 380, 677, 186-E6 (1991) (Orig. paper in 373, 66, 86-G5 (1991))
- HARVEY, PAUL M. Dust Properties around Evolved Stars from Far-Infrared Size Limits. *Paul M. Harvey, Daniel F. Lester, David Brock, & Marshall Joy.* 368, 558, 32-A8 (1991)
- HASAN, HASHIMA. The Imaging Performance of the *Hubble Space Telescope*. *Christopher J. Burrows, Jon A. Holtzman, S. M. Faber, Pierre Y. Bely, Hashima Hasan, C. R. Lynds, & Daniel Schroeder.* 369, L21, 45-C1 (1991)
- HASEGAWA, T. A Spectroscopic Study of the DR 21 Outflow Source. III. The CO Line Emission. *R. P. Garden, M. Hayashi, I. Gatley, T. Hasegawa, & N. Kaifu.* 374, 540, 105-G11 (1991)
- HASEGAWA, T. I. Episodic Outflows from High-Mass Protostars. *G. F. Mitchell, J.-P. Maillard, & T. I. Hasegawa.* 371, 342, 64-D1 (1991)
- HASEGAWA, TATSUHIKO I. An Extremely High Velocity CO Outflow from NGC 7538 IRS 9. *George F. Mitchell & Tatsuhiiko I. Hasegawa.* 371, L33, 66-E1 (1991)
- Observations of  $\text{HCO}^+$  in B335. *Tatsuhiiko I. Hasegawa, C. Rogers, & Saeko Suzuki Hayashi.* 374, 177, 100-C1 (1991)
- HASEGAWA, TETSUO. Infrared Fluorescence of  $\text{H}_2$  in NGC 6240: A Starburst Origin for the  $\text{H}_2$  Luminosity. *Masuo Tanaka, Tetsuo Hasegawa, & Ian Gatley.* 374, 516, 105-E9 (1991)
- Molecular Observations of the L723 Region: Interaction between the Clumpy Outflow and the Gaseous Core? *Saeko S. Hayashi, Tetsuo Hasegawa, & Norio Kaifu.* 377, 492, 145-G5 (1991)
- A Finger-like Extension of the 20 Kilometer per Second Cloud toward the Galactic Center. *Sachiko K. Okumura, Masato Ishiguro, Edward B. Fomalont, Tetsuo Hasegawa, Takashi Kasuga, Koh-Ichiro Morita, Ryohki Kawabe, & Hideyuki Kobayashi.* 378, 127, 152-E9 (1991)
- HASER, S. See HEAP, S. R., et al. First Results from the Goddard High-Resolution Spectrograph: Spectroscopic Determination of Stellar Parameters of Melnick 42, an O3f Star in the Large Magellanic Cloud.
- HASSLER, DONALD M. Systematic Radial Flows in the Chromosphere, Transition Region, and Corona of the Quiet Sun. *Donald M. Hassler, Gary J. Rottman, & Frank Q. Orrall.* 372, 710, 84-E1 (1991)
- HATZES, ARTE P. Constraints on the Companion Object to HD 114762. *William D. Cochran, Arte P. Hatzes, & Terry J. Hancock.* 380, L35, 181-E6 (1991)
- HAUSER, M. G. See SMOOTH, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a 7° Beam by the *Cosmic Background Explorer* (COBE).
- HAWARDEN, T. The Infrared and Optical Pulsations of G29-38. *Joseph Patterson, B. Zuckerman, E. E. Becklin, D. J. Tholen, & T. Hawarden.* 374, 330, 102-C1 (1991)
- HAWARDEN, T. G. Molecular and Atomic Hydrogen Line Emission from Star-forming Galaxies: Erratum. *P. J. Puxley, T. G. Hawarden, & C. M. Mountain.* 372, 733, 84-F13 (1991) (Orig. paper in 364, 77, 195-A1 (1990))
- HAWKINS, G. W. Spatial Studies of Planetary Nebulae with IRAS. *G. W. Hawkins & B. Zuckerman.* 374, 227, 100-G11 (1991)
- HAWKINS, ISABEL. Probing Shock Models of  $\text{CH}^+$  Formation. *Isabel Hawkins & Nahide Craig.* 375, 642, 120-F1 (1991)
- The Interstellar  $^{12}\text{CN}/^{13}\text{CN}$  Ratio toward  $\zeta$  Persei. *Mary Elizabeth Kaiser, Isabel Hawkins, & Edward L. Wright.* 379, 267, 166-D1 (1991)
- HAWKINS, M. R. S. Population Studies. X. Constraints on the Mass and Extent of the Galaxy's Dark Corona. *John E. Norris & M. R. S. Hawkins.* 380, 104, 177-C1 (1991)
- HAWLEY, JOHN F. A Powerful Local Shear Instability in Weakly Magnetized Disks. I. Linear Analysis. *Steven A. Balbus & John F. Hawley.* 376, 214, 127-E11 (1991)
- A Powerful Local Shear Instability in Weakly Magnetized Disks. II. Nonlinear Evolution. *John F. Hawley & Steven A. Balbus.* 376, 223, 127-F8 (1991)
- Three-dimensional Simulations of Black Hole Tori. *John F. Hawley.* 381, 496, 196-G9 (1991)
- HAWLSEY, SUZANNE L. Absolute Magnitudes and Kinematic Properties of Cepheids. *Teresa D. Wilson, Thomas G. Barnes III, Suzanne L. Hawley, & William H. Jefferys.* 378, 708, 161-B11 (1991)
- The Great Flare of 1985 April 12 on AD Leonis. *Suzanne L. Hawley & Björn R. Petersen.* 378, 725, 161-D1 (1991)
- HAXTON, W. C. Neutrino-Nucleus Interactions in Core-Collapse Supernovae. *Stephen W. Bruenn & W. C. Haxton.* 376, 678, 134-G1 (1991)
- HAYASHI, M. A Spectroscopic Study of the DR 21 Outflow Source. III. The CO Line Emission. *R. P. Garden, M. Hayashi, I. Gatley, T. Hasegawa, & N. Kaifu.* 374, 540, 105-G11 (1991)
- HAYASHI, SAeko S. Molecular Observations of the L723 Region: Interaction between the Clumpy Outflow and the Gaseous Core? *Saeko S. Hayashi, Tetsuo Hasegawa, & Norio Kaifu.* 377, 492, 145-G5 (1991)
- HAYASHI, SAeko SUZUKI. Observations of  $\text{HCO}^+$  in B335. *Tatsuhiiko I. Hasegawa, C. Rogers, & Saeko Suzuki Hayashi.* 374, 177, 100-C1 (1991)
- HAYASHI, Y. See ADARKAR, H., et al. Search for High-Energy Neutrinos from Celestial Sources in the Kolar Gold Fields Experiment.
- HAYASHIDA, K. See KII, T., et al. X-Ray Continuum and Evidence for an Iron Emission Line from the Quasar E1821+643.
- HAYES, B. T. The  $^{54}\text{Mn}$  Clock and Its Implications for Cosmic-Ray Propagation and Fe Isotope Studies. *J. E. Grove, B. T. Hayes, R. A. Mewaldt, & W. R. Webber.* 377, 680, 148-B3 (1991)
- HAYNES, M. P. Neutral Hydrogen Observations of Galaxies in Superclusters. *M. P. Haynes & R. Giovanelli.* 77, 331, 49-B1 (1991)
- HAYNES, MARTHA P. The Peculiar Velocity Field in the Hercules Region. *Wolfram Freudling, Hugo Martel, & Martha P. Haynes.* 377, 349, 144-B12 (1991)
- Scale-invariant Clustering in the Large-Scale Distribution of Galaxies. *Luigi Guzzo, Angela Iovino, Guido Chincarini, Riccardo Giovanelli, & Martha P. Haynes.* 382, L5, 205-B1 (1991)
- HAZARD, C. A Radio-quiet Galaxy at Redshift  $z = 3.409$ . *D. A. Turnshek, F. Macchetto, M. V. Bencke, C. Hazard, W. B. Sparks, & R. G. McMahon.* 382, 26, 200-D1 (1991)
- HAZARD, CYRIL. A New Spectroscopic Survey for Damped Ly $\alpha$  Absorption Lines from High-Redshift Galaxies. *Kenneth M. Lanzetta, Arthur M. Wolfe, David A. Turnshek, Limin Lu, Richard G. McMahon, & Cyril Hazard.* 77, 1, 43-B1 (1991)
- HEAP, S. R. See HUTCHINGS, J. B., et al. First Results from the Goddard High-Resolution Spectrograph: Ultraviolet Spectra of a Starburst Knot in NGC 1068.
- First Results from the Goddard High-Resolution Spectrograph: Spectroscopic Determination of Stellar Parameters of Melnick 42, an O3f Star in the Large Magellanic Cloud. *S. R. Heap, B. Altner, D. Ebbets, I. Hubeny, J. B. Hutchings, R. P. Kudritzki, S. A. Voels, S. Haser, A. Pauldrach, J. Puls, & K. Butler.* 377, L29, 143-D6 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Evidence for Photospheric Microturbulence in Early O Stars: Are Surface Gravities Systematically Underestimated? *I. Hubeny, S. R. Heap, & B. Altner.* 377, L33, 143-D11 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Resolved Velocity and Density Structure in the  $\beta$  Pictoris Circumstellar Gas. *A. Boggess, Frederick C. Bruhweiler, C. A. Grady, Dennis C. Ebbets, Yoji Kondo, L. M. Trafton, John C. Brandt, & S. R. Heap.* 377, L49, 143-F1 (1991)
- HEATHCOTE, S. R. Measurements of the Diameter of the Supernova SN 1987A. *M. Karovska, P. Nisenson, C. Standley, & S. R. Heathcote.* 367, L15, 17-C8 (1991)
- The Evolution and Classification of Postoutburst Novae Spectra. *R. E. Williams, M. Hamuy, M. M. Phillips, S. R. Heathcote, Lisa Wells, & M. Navarrete.* 376, 721, 135-C7 (1991)

- HECHT, J. H. The Nature of the Dust around R Coronae Borealis Stars: Isolated Amorphous Carbon or Graphite Fractals? *J. H. Hecht*. 367, 635, 21-B9 (1991)
- HECHT, JAMES H. Observations That Link Infrared Cirrus and Ultraviolet Extinction. *John A. Hackwell, James H. Hecht, & Mauricio Tapia*. 375, 163, 113-A9 (1991)
- HECKMAN, TIMOTHY M. Spatially Resolved Optical Images of High-Redshift Quasi-stellar Objects. *Timothy M. Heckman, Matthew D. Lehner, Wil van Breugel, & George K. Miley*. 370, 78, 48-A7 (1991)
- Spectroscopy of Spatially Extended Material around High-Redshift Radio-loud Quasars. *Timothy M. Heckman, Matthew D. Lehner, George K. Miley, & Wil van Breugel*. 381, 373, 195-D1 (1991)
- HEERE, KAREN R. Dynamical Evolution and Molecular Abundances of Interstellar Clouds. *Sheo S. Prasad, Karen R. Heere, & Shankar P. Tarafdar*. 373, 123, 87-E5 (1991)
- HEFLIN, M. B. First- and Second-Epoch VLBI Observations of the Gravitational Lens System 2016+112. *M. B. Heflin, M. V. Gorenstein, C. R. Lawrence, & B. F. Burke*. 378, 519, 158-G9 (1991)
- HEFLIN, MIKE. The Fourth MIT-Green Bank 5 GHz Survey. *Mark Griffith, Glen Langston, Mike Heflin, Sam Conner, & Bernard Burke*. 75, 801, 12-C5 (1991)
- HEGE, E. K. R Aquarii: H $\alpha$  Map of Subarcsecond Inner Structure. *E. K. Hege, C. K. Allen, & W. J. Cocke*. 381, 543, 197-D6 (1991)
- HEGYI, DENNIS J. Interstellar  $^{12}\text{C}/^{13}\text{C}$  Ratio Revisited. *Philippe Crane, Dennis J. Hegyi, & David L. Lambert*. 378, 181, 153-C1 (1991)
- HEILES, CARL. A Survey of H I 21 Centimeter Emission Lines toward Supernova Remnants. *Bon-Chul Koo & Carl Heiles*. 382, 204, 202-F11 (1991)
- HEINDL, WILLIAM A. Coded-Aperture Imaging of the Galactic Center Region at Gamma-Ray Energies. *Walter R. Cook, John M. Grunsfeld, William A. Heindl, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone*. 372, L75, 85-D1 (1991)
- HELBIG, THOMAS. Gravitational Effects of Light Scalar Particles. *Thomas Helbig*. 382, 223, 203-A7 (1991)
- HELD, E. V. Is the Standard Elliptical NGC 3379 a Triaxial Disk Galaxy? *M. Capaccioli, M. Vietri, E. V. Held, & H. Lorenz*. 371, 535, 68-B12 (1991)
- HELPAND, D. J. An X-Ray Image of the Violent Interstellar Medium in 30 Doradus. *Q. Wang & D. J. Helpand*. 370, 541, 55-B9 (1991)
- The Detection of X-Ray Emission from the OB Associations of the Large Magellanic Cloud. *Q. Wang & D. J. Helpand*. 373, 497, 94-B7 (1991)
- The Detection of X-Rays from the Hot Interstellar Medium of the Large Magellanic Cloud. *Q. Wang, T. Hamilton, D. J. Helpand, & X. Wu*. 374, 475, 105-A10 (1991)
- The Intensity and Spectrum of the Diffuse X-Ray Background. *X. Wu, T. Hamilton, D. J. Helpand, & Q. Wang*. 379, 564, 171-F1 (1991)
- Faint X-Ray Source Counts and the Origin of the X-Ray Background. *T. T. Hamilton, D. J. Helpand, & X. Wu*. 379, 576, 171-G1 (1991)
- HELPAND, DAVID J. The Infrared Properties of Compact Galactic Radio Sources: The Young and the Restless. *Richard L. White, Robert H. Becker, & David J. Helpand*. 371, 148, 62-A1 (1991)
- LMC-2 as the Blowout of a Hot Superbubble. *Qingde Wang & David J. Helpand*. 379, 327, 167-B5 (1991)
- HELPER, T. T. The Starburst Ring around the Seyfert Nucleus in NGC 7469. *A. S. Wilson, T. T. Helper, C. A. Haniff, & M. J. Ward*. 381, 79, 190-A6 (1991)
- HELMINGER, PAUL. Millimeter- and Submillimeter-Wave Spectrum of Highly Excited States of Water. *J. C. Pearson, Todd Anderson, Eric Herbst, Frank C. De Lucia, & Paul Helminger*. 379, L41, 169-D12 (1991)
- HELOU, G. What COBE Might See: The Far-Infrared Cosmological Background. *C. A. Beichman & G. Helou*. 370, L1, 53-B1 (1991)
- Correlations between Far-Infrared, Radio, and Blue Luminosities of Spiral Galaxies. *J. J. Condon, M. L. Anderson, & G. Helou*. 376, 95, 126-B7 (1991)
- Very Small Grains and the Infrared Colors of Galaxies. *G. Helou, C. Ryter, & B. T. Soifer*. 376, 505, 132-F6 (1991)
- HEMENWAY, P. D. See FRANZ, O. G., et al. Binary Star Observations with the *Hubble Space Telescope* Fine Guidance Sensors. I. ADS 11300.
- HENRI, GILLES. Relativistic Electron-Positron Beam Formation in the Framework of the Two-Flow Model for Active Galactic Nuclei. *Gilles Henri & Guy Pelletier*. 383, L7, 219-B1 (1991)
- HENRIKSEN, R. N. On Molecular Cloud Scaling Laws and Star Formation. *R. N. Henriksen*. 377, 500, 146-A1 (1991)
- HENRY, G. W. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- HENRY, GREGORY W. The Extraordinary 1989 December 14/15 Optical Flare Events on V711 Tauri. *Gregory W. Henry & Douglas S. Hall*. 373, L9, 91-B7 (1991)
- HENRY, J. P. Expectations for X-Ray Cluster Observations by the *ROSAT* Satellite. *A. E. Evrard & J. P. Henry*. 383, 95, 213-C1 (1991)
- HENRY, J. PATRICK. A Measurement of the Mass Fluctuation Spectrum from the Cluster X-Ray Temperature Function. *J. Patrick Henry & Keith A. Arnaud*. 372, 410, 80-G11 (1991)
- The *Einstein Observatory* Extended Medium-Sensitivity Survey. II. The Optical Identifications. *John T. Stocke, Simon L. Morris, I. M. Gioia, T. Maccacaro, R. Schild, A. Wolter, Thomas A. Fleming, & J. Patrick Henry*. 76, 813, 36-B1 (1991)
- HENRY, R. C. Studies of H I and D I in the Local Interstellar Medium: Erratum. *J. Murthy, R. C. Henry, H. W. Moos, A. Vidal-Madjar, J. L. Linsky, & C. Gry*. 378, 455, 156-E8 (1991) (Orig. paper in 356, 223, 101-G5 (1990))
- See FELDMAN, P. D., et al. Observations of Comet Levy (1990c) with the Hopkins Ultraviolet Telescope.
- See MOOS, H. W., et al. Determination of Ionic Abundances in the Io Torus Using the Hopkins Ultraviolet Telescope.
- Constraints on the Optical Properties of Interstellar Dust in the Far-Ultraviolet: *Voyager* Observations of the Diffuse Sky Background. *Jayant Murthy, R. C. Henry, & J. B. Holberg*. 383, 198, 214-E1 (1991)
- HENRY, RICHARD C. See BLAIR, WILLIAM P., et al. Discovery of a Fast Radiative Shock Wave in the Cygnus Loop Using the Hopkins Ultraviolet Telescope.
- See LONG, KNOX S., et al. Spectroscopy of Z Camelopardalis in Outburst with the Hopkins Ultraviolet Telescope.
- See FERGUSON, HENRY C., et al. Constraints on the Origin of the Ultraviolet Upturn in Elliptical Galaxies from Hopkins Ultraviolet Telescope Observations of NGC 1399.
- HENRY, RONALD J. W. Fe XII Line Ratios in Solar Flares. *S. S. Tayal, Ronald J. W. Henry, F. P. Keenan, S. M. McCann, & K. G. Widgren*. 369, 567, 44-G1 (1991)
- HENRY, TODD J. A Standard Stellar Spectral Sequence in the Red/Near-Infrared: Classes K5 to M9. *J. Davy Kirkpatrick, Todd J. Henry, & Donald W. McCarthy, Jr.* 77, 417, 50-C5 (1991)
- HERANT, M. Flares Observed by the Normal Incidence X-Ray Telescope on 1989 September 11. *M. Herant, F. Pardo, E. Spiller, & L. Golub*. 376, 797, 136-C6 (1991)
- HERANT, MARC. Hydrodynamical Instabilities and Mixing in SN 1987A: Two-dimensional Simulations of the First 3 Months. *Marc Herant & Willy Benz*. 370, L81, 59-D6 (1991)
- HERBIG, G. H. The Diffuse Interstellar Bands. VIII. New Features between 6000 and 8650 Å. *G. H. Herbig & K. D. Leka*. 382, 193, 202-E12 (1991)
- HERBST, ERIC. The Formation of Oxygen-containing Organic Molecules in the Orion Compact Ridge. *T. J. Millar, Eric Herbst, & S. B. Charnley*. 369, 147, 37-F11 (1991)
- The Gas-Phase Chemistry of Organic Molecules in Interstellar Clouds with Dynamical Mixing. *J.-P. Chèze, G. Pineau des Forets, & Eric Herbst*. 373, 110, 87-D4 (1991)
- Calculations Concerning the Reaction C + H $_3^+$  → CH $^+$  + H $_2$ . *D. Talbi, D. J. DeFrees, D. A. Egolf, & Eric Herbst*. 374, 390, 103-A1 (1991)
- Can Phase Space Theory Reproduce Experimental Neutral Product Branching Ratios for Dissociative Recombination Reactions? *E. T. Galloway & Eric Herbst*. 376, 531, 133-A8 (1991)
- Millimeter- and Submillimeter-Wave Spectrum of Highly Excited States of Water. *J. C. Pearson, Todd Anderson, Eric Herbst, Frank C. De Lucia, & Paul Helminger*. 379, L41, 169-D12 (1991)

- HERBST, W. The High State of the FU Orionis Variable Z Canis Majoris. *F. V. Hessman, J. Eisloffel, R. Mundi, L. W. Hartmann, W. Herbst, & J. Krautter.* 370, 384, 52-A10 (1991)
- HERBST, WILLIAM. The Chromospheric Activity of Low-Mass Stars in the Hyades. *John R. Stauffer, Mark S. Giampapa, William Herbst, James M. Vincent, Lee W. Hartmann, & Robert A. Stern.* 374, 142, 99-G1 (1991)
- Rotation Periods for Seven Stars in the Trapezium Cluster. *Gregory N. Mandel & William Herbst.* 383, L75, 226-E11 (1991)
- HERELD, M. See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- HERELD, MARK. HH 5, HH 6, and Their Exciting Stars. *Martin Cohen, Burton F. Jones, & Mark Hereld.* 371, 237, 63-B1 (1991)
- HERNANDEZ, CARLOS. Spectroscopic Binaries in the Open Cluster Trumpler 16. *Hugo Levato, Stella Malaroda, Nidia Morrell, Beatriz Garcia, & Carlos Hernandez.* 75, 869, 13-C13 (1991)
- HERNOVIST, LARS. Application of the Ewald Method to Cosmological N-Body Simulations. *Lars Hernquist, Francois R. Bouchet, & Yasushi Suto.* 75, 231, 4-B1 (1991)
- Cosmological N-Body Simulations with a Tree Code: Fluctuations in the Linear and Nonlinear Regimes. *Tatsushi Sugihara, Yasushi Suto, Francois R. Bouchet, & Lars Hernquist.* 75, 631, 10-B1 (1991)
- Stability of Nonrotating Stellar Systems. II. Prolate Shell-Orbit Models. *David Merritt & Lars Hernquist.* 376, 439, 131-G13 (1991)
- Hydrodynamics of Collisions between Binary Stars. *Jeremy Goodman & Lars Hernquist.* 378, 637, 160-C11 (1991)
- HERNOVIST, LARS E. Fueling Starburst Galaxies with Gas-rich Mergers. *Joshua E. Barnes & Lars E. Hernquist.* 370, L65, 59-B7 (1991)
- HERREIRA, L. The Evolution of Discontinuities in Radiating Spheres in the Diffusion Approximation. *W. Barreto, L. Herrera, & L. Nunez.* 375, 663, 121-A1 (1991)
- Conformally Symmetric Spheres in the Thin Wall Approximation: Erratum. *L. Herrera, J. Ibanez, & A. Di Prisco.* 376, 367, 129-D12 (1991) (Orig. paper in 353, 579, 71-B4 (1990))
- The Effects of Thermal Radiation on Some General Relativistic Stellar Models. *J. M. Aguirregabiria, J. Ibanez, A. Di Prisco, & L. Herrera.* 376, 662, 134-E8 (1991)
- Diffusion Processes in the Collapse of a Radiating Spherical Body. *R. Chan, L. Herrera, J. A. F. Pacheco, & N. O. Santos.* 382, 255, 203-D1 (1991)
- HERRMANN, F. The Optical Depth of the 158 Micron [ $^{12}\text{C}$  II] Line: Detection of the  $F = 1 \rightarrow 0$  [ $^{13}\text{C}$  II] Hyperfine-Structure Component. *G. J. Stacey, C. H. Townes, A. Poglitsch, S. C. Madden, J. M. Jackson, F. Herrmann, R. Genzel, & N. Geis.* 382, L37, 205-E1 (1991)
- HERTER, TERRY. Spectroscopy of Taurus Cloud Brown Dwarf Candidates. *John Stauffer, Terry Herter, Donald Hamilton, George H. Rieke, Marcia J. Rieke, Ron Probst, & William Forrest.* 367, L23, 17-D7 (1991)
- HERTZ, P. Observations of Scorpius X-1 with IUE: Ultraviolet Results from a Multiwavelength Campaign. *S. D. Vrilek, W. Penninx, J. C. Raymond, F. Verbunt, P. Hertz, K. Wood, W. H. G. Lewin, & K. Mitsuda.* 376, 278, 128-D1 (1991)
- See WOOD, K. S., et al. Searches for Millisecond Pulsations in Low-Mass X-Ray Binaries.
- HESSE, M. Magnetic Field-aligned Electric Potentials in Nonideal Plasma Flows. *K. Schindler, M. Hesse, & J. Birn.* 380, 293, 179-G9 (1991)
- HESSER, JAMES E. C and N Abundances among 47 Tucanae Main-Sequence Stars. *Michael M. Briley, James E. Hesser, & R. A. Bell.* 373, 482, 94-A1 (1991)
- HESSMAN, F. V. The High State of the FU Orionis Variable Z Canis Majoris. *F. V. Hessman, J. Eisloffel, R. Mundi, L. W. Hartmann, W. Herbst, & J. Krautter.* 370, 384, 52-A10 (1991)
- HESSMAN, FREDERIC V. An Optical/Infrared Outburst in the Exciting Source of HH 7-11. *Jochen Eisloffel, Eike Günther, Frederic V. Hessman, Reinhard Mundt, Ralf Poetzl, John S. Carr, Steven Beckwith, & Tom P. Ray.* 383, L19, 219-C7 (1991)
- HESTER, J. J. Observation of a Pulsar Wind: CCD Polarimetry of the Crab Nebula. *F. C. Michel, P. A. Scowen, R. J. Dufour, & J. J. Hester.* 368, 463, 30-G1 (1991)
- HESTER, J. JEFF. See LYND, ROGER, et al. NGC 1068: Resolution of Nuclear Structure in the Optical Continuum.
- See HOLTZMAN, JON A., et al. Stellar Photometry with the *Hubble Space Telescope* Wide-Field/Planetary Camera: A Progress Report.
- See LAUER, TOD R., et al. The Core of the Nearby S0 Galaxy NGC 7457 Imaged with the *HST* Planetary Camera.
- See LAUER, TOD R., et al. The Postcollapse Core of M15 Imaged with the *HST* Planetary Camera.
- See WESTPHAL, JAMES A., et al. *Hubble Space Telescope* Wide-Field/Planetary Camera Images of Saturn.
- Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0''.1. *J. Jeff Hester, R. Gilmozzi, C. R. O'Dell, S. M. Faber, Bel Campbell, Arthur Code, Douglas G. Currie, G. Edward Danielson, S. P. Ewald, Edward J. Groth, Jon A. Holtzman, T. Kellogg, Tod R. Lauer, Robert M. Light, Roger Lynds, Earl J. O'Neil, Jr., Edward J. Shaya, & James A. Westphal.* 369, L75, 46-C7 (1991)
- Near-Infrared Emission-Line Images of Three Herbig-Haro Objects. *Karl R. Stapelfeldt, Charles A. Beichman, J. Jeff Hester, Nicholas Z. Scoville, & Thomas N. Gautier III.* 371, 226, 63-A1 (1991)
- HEWETT, PAUL C. A New Survey for Quasar Clustering. *Patrick S. Osmer & Paul C. Hewett.* 75, 273, 4-E9 (1991)
- A Wide-Field Multicolor Survey for High-Redshift Quasars,  $z \geq 2.2$ . I. Photometric Catalog and Survey Selection Function. *Stephen J. Warren, Paul C. Hewett, Michael J. Irwin, & Patrick S. Osmer.* 76, 1, 24-B1 (1991)
- A Wide-Field Multicolor Survey for High-Redshift Quasars,  $z \geq 2.2$ . II. The Quasar Catalog. *Stephen J. Warren, Paul C. Hewett, & Patrick S. Osmer.* 76, 23, 24-D3 (1991)
- Comparisons of the Emission-Line and Continuum Properties of Broad Absorption Line and Normal Quasi-stellar Objects. *Ray J. Weymann, Simon L. Morris, Craig B. Foltz, & Paul C. Hewett.* 373, 23, 86-C13 (1991)
- A High Signal-to-Noise Ratio Composite Quasar Spectrum. *Paul J. Francis, Paul C. Hewett, Craig B. Foltz, Frederic H. Chaffee, Ray J. Weymann, & Simon L. Morris.* 373, 465, 93-F10 (1991)
- HEWITT, A. An Optical Catalog of Extragalactic Emission-Line Objects Similar to Quasi-stellar Objects. *A. Hewitt & G. Burbidge.* 75, 297, 5-A5 (1991)
- A Catalog of Absorption in the Spectra of Quasi-stellar Objects. *V. Junkkarinen, A. Hewitt, & G. Burbidge.* 77, 203, 47-B1 (1991)
- HEYER, MARK H. Bok Globules and Small Molecular Clouds: Deep IRAS Photometry and  $^{12}\text{CO}$  Spectroscopy. *Dan P. Clemens, Joao Lin Yun, & Mark H. Heyer.* 75, 877, 13-E1 (1991)
- HIBBERT, A. Accurate Oscillator Strengths of Astrophysical Interest for Neutral Oxygen. *E. Biémont, A. Hibbert, M. Godefroid, N. Vaeck, & B. C. Fawcett.* 375, 818, 122-G1 (1991)
- HICKSON, PAUL. The Luminosity Function of Compact Groups of Galaxies. *Cláudia Mendes de Oliveira & Paul Hickson.* 380, 30, 176-D5 (1991)
- HILL, CHRISTOPHER T. Coherent Peculiar Velocities and Periodic Redshifts. *Christopher T. Hill, Paul J. Steinhardt, & Michael S. Turner.* 366, L57, 11-B7 (1991)
- HILL, F. Do Changes in the Photospheric Magnetic Network Cause the 11 Year Variation of Total Solar Irradiance? *P. Foukal, K. Harvey, & F. Hill.* 383, L89, 226-G1 (1991)
- HILL, FRANK. Simulation of Effects of Atmospheric Seeing on the Observation of High-Degree Solar Oscillations. *Frank Hill, Douglas Gough, William J. Merryfield, & Juri Toomre.* 369, 237, 38-G7 (1991)
- HILL, G. J. A Change in the Cluster Environments of Radio Galaxies with Cosmic Epoch. *G. J. Hill & S. J. Lilly.* 367, 1, 12-A13 (1991)
- HILL, JESSE K. See BOHLIN, RALPH C., et al. Simulated Optical Images of Galaxies at  $z \sim 1$  Using Ultraviolet Images of Nearby Galaxies.
- HILL, JOHN M. Dynamics of the Microwave-Decrement Cluster Abell 665. *William R. Oegerle, Michael J. Fitchett, John M. Hill, & Paul Hintzen.* 376, 46, 125-E10 (1991)
- Discovery of a Low-Redshift Ultraluminous "E+A" Galaxy. *William R. Oegerle, John M. Hill, & John G. Hoessel.* 381, L9, 194-B7 (1991)

- HILL, ROBERT S. See BOHLIN, RALPH C., et al. Simulated Optical Images of Galaxies at  $z \sim 1$  Using Ultraviolet Images of Nearby Galaxies.
- HILLAS, A. M. See MACOMB, D. J., et al. Search for TeV Emission from 4U 0115+63.
- See VACANTI, G., et al. Gamma-Ray Observations of the Crab Nebula at TeV Energies.
- See AKERLOF, C. W., et al. Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy.
- See REYNOLDS, P. T., et al. Search for TeV Gamma-Ray Emission from Hercules X-1.
- HILLS, J. G. Stellar Encounters Involving Red Giants in Globular Cluster Cores. *M. B. Davies, W. Benz, & J. G. Hills.* 381, 449, 196-C7 (1991)
- HILLS, R. E. First Observations of the CO  $J = 6-5$  Transition in Starburst Galaxies. *A. I. Harris, R. E. Hills, J. Stutzki, U. U. Graf, A. P. G. Russell, & R. Genzel.* 382, L75, 211-C7 (1991)
- HILS, D. Gravitational Radiation from the Galaxy. *D. Hils, P. L. Bender, & R. F. Webbink.* 369, 271, 39-C9 (1991) (Orig. paper in 360, 75, 146-A6 (1990))
- HILS, DIETER. Gravitational Radiation from Dual Neutron Star Elliptical Binaries. *Dieter Hils.* 381, 484, 196-F5 (1991)
- HINE, B. P. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- HINES, DEAN C. Broad Paschen-Alpha Emission in Two Extremely Infrared Luminous Seyfert 2 Galaxies. *Dean C. Hines.* 374, L9, 103-C7 (1991)
- HINKLE, KENNETH H. CN and HCN in the Infrared Spectrum of IRC +10216. *G. R. Wiedemann, Kenneth H. Hinkle, John J. Keady, D. Deming, & D. E. Jennings.* 382, 321, 204-B10 (1991)
- HINTZEN, PAUL. Dynamics of the Microwave-Decrement Cluster Abell 665. *William R. Oegerle, Michael J. Fitchett, John M. Hill, & Paul Hintzen.* 376, 46, 125-E10 (1991)
- HIPPELEIN, HANS. A Kinematic and Proper-Motion Survey of the Cygnus Loop. *Peter Shull, Jr., & Hans Hippelein.* 383, 714, 223-B3 (1991)
- HIRANO, NAOMI. U-shaped Outflow in the Lynds 1221 Dark Cloud: An Example of Interaction of Outflows with Ambient Molecular Clouds. *Tomofumi Umemoto, Naomi Hirano, Osamu Kameya, Yasuo Fukui, Nario Kuno, & Keiya Takakubo.* 377, 510, 146-A13 (1991)
- HIROMOTO, NORIHISA. See SHIBAI, HIROSHI, et al. Large-Scale [C II] 158 Micron Emission from the Galaxy.
- HJELLMING, MICHAEL S. The Response of Main-Sequence Stars within a Common Envelope. *Michael S. Hjellming & Ronald E. Taam.* 370, 709, 57-C1 (1991)
- HJELLMING, R. M. The Proper Motion of the Soft X-Ray-emitting Radio Pulsar PSR 0656+14. *R. J. Thompson, Jr., F. A. Cerdova, R. M. Hjellming, & E. B. Fomalont.* 366, L83, 11-E1 (1991)
- HO, PAUL T. P. Hot Gas in the Nucleus of M82:  $^{12}\text{CO}$  and  $^{13}\text{CO}$   $J = 3-2$  Observations. *Jean L. Turner, Robert N. Martin, & Paul T. P. Ho.* 367, 677, 21-F6 (1991) (Orig. paper in 351, 418, 45-C5 (1990))
- The Interstellar Medium of the Hot-Spot Galaxy NGC 2903. *James M. Jackson, Andreas Eckart, Murray Cameron, Wolfgang Wild, Paul T. P. Ho, Richard W. Pogge, & Andrew I. Harris.* 375, 105, 112-C9 (1991)
- HOARE, M. G. See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- HOBAN, SUSAN. Molecular Hydrogen in the Vicinity of NGC 7538 IRS 1 and IRS 2: Temperature and Ortho-to-Para Ratio. *Susan Hoban, Dennis C. Reuter, Michael J. Mumma, & Alex D. Storrs.* 370, 228, 50-A10 (1991)
- HOBBS, L. M. Predicted Profiles of Ultraviolet Interstellar Absorption Lines. *D. E. Welty, L. M. Hobbs, & D. G. York.* 75, 425, 6-E5 (1991)
- The Interstellar D<sub>1</sub> Line at High Resolution. *L. M. Hobbs & D. E. Welty.* 368, 426, 30-D1 (1991)
- An Extreme Population II Dwarf without Lithium. *L. M. Hobbs, D. E. Welty, & J. A. Thorburn.* 373, L47, 97-B13 (1991)
- The Lithium Abundance in Extreme Halo Stars. *L. M. Hobbs & J. A. Thorburn.* 375, 116, 112-D8 (1991)
- Variable Interstellar Absorption toward HD 72127A. II. 1981-1988. *L. M. Hobbs, R. Ferlet, D. E. Welty, & G. Wallerstein.* 378, 586, 159-F1 (1991)
- HODAPP, K. W. See KOYAMA, K., et al. An X-Ray Pulsator in the Direction of Molecular Cloud MBM 12 (Lynds 1457).
- HODAPP, K.-W. Infrared Emission Regions in the Interacting Galaxy System Arp 299. *C. G. Wynn-Williams, S. A. Eales, E. E. Becklin, K.-W. Hodapp, R. D. Joseph, I. S. McLean, D. A. Simons, & G. S. Wright.* 377, 426, 145-A13 (1991)
- HODGE, PAUL. Continuum Emission at 1 Millimeter from the Elliptical Galaxy NGC 205. *Michel Fich & Paul Hodge.* 374, L17, 103-D7 (1991)
- A COSMOS Study of the Structure and Content of NGC 6822. *Paul Hodge, Toby Smith, Paul Eskridge, Harvey MacGillivray, & Steven Beard.* 379, 621, 172-D1 (1991)
- H II Regions in Seven Dwarf Irregular Galaxies. *Nicolas V. Strobel, Paul Hodge, & Robert C. Kennicutt, Jr.* 383, 148, 213-G3 (1991)
- HODGE, PAUL W. A Cosmos Study of IC 1613. *Paul W. Hodge, Toby R. Smith, Paul B. Eskridge, Harvey T. MacGillivray, & Steven M. Beard.* 369, 372, 42-D5 (1991)
- HOESSEL, JOHN G. Fundamental Parameters of Brightest Cluster Galaxies. *William R. Oegerle & John G. Hoessel.* 375, 15, 111-B13 (1991)
- Discovery of a Low-Redshift Ultraluminous "E+A" Galaxy. *William R. Oegerle, John M. Hill, & John G. Hoessel.* 381, L9, 194-B7 (1991)
- HOFFMAN, C. M. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- HOFFMAN, G. LYLE. NGC 4286 and NGC 3377A: Galaxies with Mixed Morphologies between the Dwarf Im and de/DSO Types. *Allan Sandage & G. Lyle Hoffman.* 379, L45, 175-A11 (1991)
- HOFFMAN, ROBERT D.  $^{57}\text{Co}$  and  $^{44}\text{Ti}$  Production in SN 1987A. *S. E. Woosley & Robert D. Hoffman.* 368, L31, 35-B10 (1991)
- HOFFMAN, YEHUDA. Constrained Realizations of Gaussian Fields: A Simple Algorithm. *Yehuda Hoffman & Erez Ribak.* 380, L5, 181-B6 (1991)
- HOGAN, C. J. Cosmic Backgrounds from Primeval Dust. *J. R. Bond, B. J. Carr, & C. J. Hogan.* 367, 420, 18-F1 (1991)
- Zero Point of the Supernova Hubble Diagram. *M. Fukugita & C. J. Hogan.* 368, L11, 28-C1 (1991)
- HOGAN, CRAIG J. Self-Organization of Cosmic Radiation Pressure Instability. *Craig J. Hogan.* 369, 300, 41-D8 (1991)
- Discovery of a Ly $\alpha$  Galaxy near a Damped Ly $\alpha$  Absorber at  $z = 2.3$ . *James D. Lowenthal, Craig J. Hogan, Richard F. Green, Adeline Caulet, Bruce E. Woodgate, Larry Brown, & Craig B. Fotis.* 377, L73, 150-C1 (1991)
- HOGG, D. E. The Expansion of the Crab Nebula. *M. F. Bietenholz, P. P. Kronberg, D. E. Hogg, & A. S. Wilson.* 373, L59, 97-D5 (1991)
- HOGG, DAVID E. Interstellar Matter in Early-Type Galaxies. I. The Catalog. *Morton S. Roberts, David E. Hogg, Joel N. Bregman, William R. Forman, & Christine Jones.* 75, 751, 11-F5 (1991)
- HOLBERG, J. B. The Isolated Massive DA White Dwarf GD 50. *P. Bergeron, K. M. Kidder, J. B. Holberg, James Liebert, F. Wesemael, & Rex A. Saffer.* 372, 267, 77-C5 (1991)
- Far-Ultraviolet Mapping of the Cygnus Loop with the Voyager 2 Ultraviolet Spectrometer. *William P. Blair, Knox S. Long, Olaf Vancura, & J. B. Holberg.* 374, 202, 100-E5 (1991)
- Absolute Far-Ultraviolet Spectrophotometry of Hot Subluminous Stars from Voyager. *J. B. Holberg, B. Ali, T. E. Carone, & R. S. Polidan.* 375, 716, 121-E11 (1991)
- Constraints on the Optical Properties of Interstellar Dust in the Far-Ultraviolet: Voyager Observations of the Diffuse Sky Background. *Jayant Murthy, R. C. Henry, & J. B. Holberg.* 383, 198, 214-E1 (1991)
- HOLCOMB, K. A. A Mechanism for Gamma-Ray Bursts by Alfvén-Wave Acceleration in a Nonuniform Atmosphere. *K. A. Holcomb & T. Tajima.* 378, 682, 160-G10 (1991)
- HOLCOMB, KATHERINE A. Numerical Solution of the General Relativistic Boltzmann Equation for Massive and Massless Particles. *Hugh Harleston & Katherine A. Holcomb.* 372, 225, 76-F13 (1991)
- HOLLENBACH, DAVID. Observations of [Si II] (35 Micron) and [S II] (25 Micron) in Orion: Evidence for a Wind Shock near IRc2.

- Michael R. Haas, David Hollenbach, & Edwin F. Erickson.* 374, 555, 106-B1 (1991)
- HOLLENBACH, DAVID J. Radiative Transfer in Astronomical Masers. III. Filamentary Masers. *Moshe Elitzur, Christopher P. McKee, & David J. Hollenbach.* 367, 333, 16-B10 (1991)
- Low-Density Photodissociation Regions. *David J. Hollenbach, Takamasa Takahashi, & A. G. G. M. Tielens.* 377, 192, 140-C11 (1991)
- HOLLIS, J. M. Ultraviolet and Optical Spectroscopy of the R Aquari Symmetrical Jet. *J. M. Hollis, R. J. Oliversen, M. Kafatos, A. G. Michalitsianos, & R. M. Wagner.* 377, 227, 140-F11 (1991)
- HOLMAN, G. D. See NITTA, N., et al. Coronal Magnetic Structures Observing Campaign. I. Simultaneous Microwave and Soft X-Ray Observations of Active Regions at the Solar Limb.
- HOLT, S. S. *Einstein Observatory* SSS and MPC Observations of the Complex X-Ray Spectra of Seyfert Galaxies. *T. J. Turner, K. A. Weaver, R. F. Mushotzky, S. S. Holt, & G. M. Madejski.* 381, 85, 190-B1 (1991)
- HOLTZMAN, JON A. The Imaging Performance of the *Hubble Space Telescope*. *Christopher J. Burrows, Jon A. Holtzman, S. M. Faber, Pierre Y. Bely, Hashima Hasan, C. R. Lynds, & Daniel Schroeder.* 369, L21, 45-C1 (1991)
- See LYNDS, ROGER, et al. NGC 1068: Resolution of Nuclear Structure in the Optical Continuum.
- Stellar Photometry with the *Hubble Space Telescope* Wide-Field/Planetary Camera: A Progress Report. *Jon A. Holtzman, Edward J. Groth, Robert M. Light, S. M. Faber, Deidre Hunter, Earl J. O'Neil, Jr., Edward J. Shaya, William A. Baum, Bel Campbell, Arthur Code, Douglas G. Currie, S. P. Ewald, J. Jeff Hester, T. Kelsall, Tod R. Lauer, Roger Lynds, Donald P. Schneider, P. Kenneth Seidelmann, & James A. Westphal.* 369, L35, 45-E1 (1991)
- See LAUER, TOD R., et al. The Core of the Nearby S0 Galaxy NGC 7457 Imaged with the *HST* Planetary Camera.
- See LAUER, TOD R., et al. The Postcollapse Core of M15 Imaged with the *HST* Planetary Camera.
- See HESTER, J. JEFF, et al. Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0''.1.
- HOLZER, THOMAS E. The Effects of Mass Flow on the Temperature and Abundance Structure of the Solar Transition Region. *D. Tod Woods & Thomas E. Holzer.* 375, 800, 122-E7 (1991)
- HONEYCUTT, R. KENT. Mass Loss in the 96 Day Binary UU Cancri. *Joel A. Eaton, Douglas S. Hall, & R. Kent Honeycutt.* 376, 289, 128-E1 (1991)
- HORNE, KEITH. Evidence for CNO Processed Material in the Accretion Disk of GP Comae. *T. R. Marsh, Keith Horne, & Simon Rosen.* 366, 535, 9-F1 (1991)
- Echo Mapping of Broad H $\beta$  Emission in NGC 5548. *Keith Horne, William F. Welsh, & Bradley M. Peterson.* 367, L5, 17-B10 (1991)
- Ultraviolet Variability of NGC 5548: Dynamics of the Continuum Production Region and Geometry of the Broad-Line Region. *J. H. Krolik, Keith Horne, T. R. Kallman, M. A. Malkan, R. A. Edelson, & G. A. Kriss.* 371, 541, 68-C6 (1991)
- Rotation and Emission Lines in Stars and Accretion Disks. *Keith Horne & Steven H. Saar.* 374, L55, 110-D6 (1991)
- Eclipse Studies of the Dwarf Nova HT Cassiopeiae. I. Observations and System Parameters. *Keith Horne, Janet H. Wood, & Rae F. Stiening.* 378, 271, 154-C11 (1991)
- Echo Images of Broad-Line Regions in Active Galactic Nuclei. *William F. Welsh & Keith Horne.* 379, 586, 172-A1 (1991)
- HOROWITZ, CHARLES J. Cold Nuclear Fusion in Dense Metallic Hydrogen. *Charles J. Horowitz.* 367, 288, 15-E13 (1991)
- HOSSAIN, MURSHED. Three-dimensional Compressible Hydrodynamic Convection in the Sun and Stars. *Murshed Hossain & D. J. Mullan.* 380, 631, 186-A10 (1991)
- HOUCK, JOHN C. Steady Spherical Hypercritical Accretion onto Neutron Stars. *John C. Houck & Roger A. Chevalier.* 376, 234, 127-G6 (1991)
- HOUGH, J. H. Optical and Near-Infrared Polarimetry of the Infrared Luminous Galaxy IRAS 23060+0505. *J. H. Hough, C. Brindle, Beverley J. Wills, D. Wills, & J. Bailey.* 372, 478, 81-F9 (1991)
- Molecular Hydrogen Polarization Images of OMC-1. *Michael G. Burton, N. R. Minchin, J. H. Hough, C. Aspin, D. J. Axon, & J. A. Bailey.* 375, 611, 120-C9 (1991)
- HOWARD, R. A. Solar Gamma-Ray-Line Flares, Type II Radio Bursts, and Coronal Mass Ejections. *E. W. Cliver, H. V. Cane, D. J. Forrest, M. J. Koomen, R. A. Howard, & C. S. Wright.* 379, 741, 174-A2 (1991)
- HOWARD, W. MICHAEL. A New Site for the Astrophysical Gamma-Process. *W. Michael Howard, Bradley S. Meyer, & S. E. Woosley.* 373, L5, 91-B1 (1991)
- HOWARTH, IAN D. Terminal Velocities for a Large Sample of O Stars, B Supergiants, and Wolf-Rayet Stars: Erratum. *Raman K. Prinja, M. J. Barlow, & Ian D. Howarth.* 383, 466, 218-B1 (1991) (Orig. paper in 379, 734, 173-G8 (1991))
- HOWE, J. E. Parsec-Scale Penetration of Ultraviolet Photons into Molecular Clouds: [C II] 158 Micron Mapping of W3, NGC 1977, and NGC 2023. *J. E. Howe, D. T. Jaffe, R. Genzel, & G. J. Stacey.* 373, 158, 88-A5 (1991)
- HOWELL, E. S. The Brightness, Albedo, and Temporal Variability of Neptune. *G. W. Lockwood, D. T. Thompson, B. L. Lutz, & E. S. Howell.* 368, 287, 26-F1 (1991)
- HOWELL, ELLEN S. Gas and Dust Production by Comet P/Halley (1910 II). *Ellen S. Howell, Barry L. Lutz, & V.M. Slipher.* 371, 776, 71-B11 (1991)
- HOWELL, STEVE B. Optical Identification of the X-Ray Source GS 2023+338 as V404 Cygni. *R. Mark Wagner, Summer G. Starfield, Steve B. Howell, Tobias J. Kreidl, S. J. Bus, A. Cassatella, R. Bertram, & R. Fried.* 378, 293, 154-E10 (1991)
- HRIVNAK, BRUCE J. On the Possible Bipolar Nature of 21 Micron IRAS Sources. *Bruce J. Hrivnak & S. Kwok.* 368, 564, 32-B1 (1991)
- The Carbon-rich Proto-Planetary Nebula IRAS 22272+5435. *Bruce J. Hrivnak & Sun Kwok.* 371, 631, 69-D6 (1991)
- HST SCIENCE WORKING GROUP, THE. Dedication Statement to Lyman Spitzer. *The HST Science Working Group.* 377, L1, 143-A3 (1991)
- HU, ESTHER M. Lyman- $\alpha$  Companions to High-z Quasars. *Esther M. Hu, Antoinette Songaila, Lennox L. Cowie, & Alan Stockton.* 368, 28, 23-D9 (1991)
- HUA, XIN-MIN. Compton Backscattered 511 keV Annihilation Line Emission and the 170 keV Line from the Galactic Center Direction. *Richard E. Lingenfelter & Xin-Min Hua.* 381, 426, 196-A10 (1991)
- HUANG, Z.-P. Compact Starbursts in Ultraluminous Infrared Galaxies. *J. J. Condon, Z.-P. Huang, Q. F. Yin, & T. X. Thuan.* 378, 65, 151-G5 (1991)
- HUBENY, I. See HEAP, S. R., et al. First Results from the Goddard High-Resolution Spectrograph: Spectroscopic Determination of Stellar Parameters of Melnick 42, an O3F Star in the Large Magellanic Cloud.
- First Results from the Goddard High-Resolution Spectrograph: Evidence for Photospheric Microturbulence in Early O Stars: Are Surface Gravities Systematically Underestimated? *I. Hubeny, S. R. Heap, & B. Altenz.* 377, L33, 143-D11 (1991)
- HUBENY, IVAN. Non-LTE Analysis of the Ofpe/WN9 Star HDE 269227 (R84). *Werner Schmutz, Claus Leitherer, Ivan Hubeny, Manfred Vogel, Wolf-Rainer Hamann, & Ulf Wesselowski.* 372, 664, 84-A1 (1991)
- HUCHRA, J. The CfA *Einstein Observatory* Extended Deep X-Ray Survey. *F. A. Primini, S. S. Murray, J. Huchra, R. Schild, R. Burg, & R. Giacconi.* 374, 440, 104-E12 (1991)
- HUCHRA, J. P. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- See MOULD, J. R., et al. The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. I. Southern Clusters.
- HUCHRA, JOHN P. The Kinematics of Abell Clusters: Erratum. *Ann. J. Zabludoff, John P. Huchra, & Margaret J. Geller.* 75, 629, 9-C13 (1991) (Orig. paper in 74, 1, 30-B1 (1990))
- Measures of Large-Scale Structure in the CfA Redshift Survey Slices. *Valerie de Lapparent, Margaret J. Geller, & John P. Huchra.* 369, 273, 41-B5 (1991)
- Extragalactic Globular Clusters. II. The M31 Globular Cluster System. *John P. Huchra, Jean P. Brodie, & Stephen M. Kent.* 370, 495, 54-E5 (1991)

- A Redshift Survey of IRAS Galaxies. II. Methods for Determining Self-consistent Velocity and Density Fields.** Amos Yahil, Michael A. Strauss, Marc Davis, & John P. Huchra. 372, 380, 80-E5 (1991)
- Extragalactic Globular Clusters. III. Metallicity Comparisons and Anomalies.** Jean P. Brodie & John P. Huchra. 379, 157, 165-A1 (1991)
- A Redshift Survey of IRAS Galaxies. II. Methods for Determining Self-consistent Velocity and Density Fields: Erratum.** Amos Yahil, Michael A. Strauss, Marc Davis, & John P. Huchra. 381, 348, 193-C10 (1991) (Orig. paper in 372, 380, 80-E5 (1991))
- Void Statistics of the CfA Redshift Survey.** Michael S. Vogeley, Margaret J. Geller, & John P. Huchra. 382, 44, 200-E12 (1991)
- HUGGINS, P. J. The Formation of Molecules in Protostellar Winds.** A. E. Glassgold, G. A. Mamon, & P. J. Huggins. 373, 254, 89-B7 (1991)
- HUGHES, D. H. Far-Infrared Counterpart to the Optical and H I Plume in the Leo Triplet of Galaxies: NGC 3623, NGC 3627, and NGC 3628.** D. H. Hughes, P. N. Appleton, & J. M. Schombert. 370, 176, 49-C11 (1991)
- HUGHES, J. P. A Measurement of the Value of the Hubble Constant from the X-Ray Properties and the Sunyaev-Zel'dovich Effect of Abell 665.** M. Birkinshaw, J. P. Hughes, & K. A. Arnaud. 379, 466, 170-E1 (1991)
- HUGHES, P. A. Synchrotron Emission from Shocked Relativistic Jets. III. Models for the Centimeter Wave Band Quiescent and Burst Emission from 3C 279 and OT 081.** P. A. Hughes, H. D. Aller, & M. F. Aller. 374, 57, 98-F5 (1991)
- See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- HUGHES, V. A. Probing the Core of Cepheus A: Millimeter and Submillimeter Observations.** G. H. Moriarty-Schieven, R. L. Snell, & V. A. Hughes. 374, 169, 100-B3 (1991)
- See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- Time-dependent Radio Sources in the Star-forming Region Cepheus A (East).** V. A. Hughes. 383, 280, 215-F1 (1991)
- HUNT, L. K. The Origin of the Far-Infrared Continuum in Active Galactic Nuclei.** L. K. Hunt. 370, 511, 54-F9 (1991)
- HUNTER, D. M. The Structure of Io's Corona.** N. M. Schneider, D. M. Hunter, W. K. Wells, A. B. Schultz, & U. Fink. 368, 298, 27-G1 (1991)
- HUNTER, DEIDRE. See HOLTZMAN, JON A., et al. Stellar Photometry with the Hubble Space Telescope Wide-Field/Planetary Camera: A Progress Report.**
- HUNTER, DEIDRE A. Far-Infrared Properties of NGC 6822.** John S. Gallagher III, Deidre A. Hunter, Fred C. Gillett, & Walter L. Rice. 371, 142, 61-G1 (1991)
- Optical Properties and Dynamics of Galaxies in the Hickson Compact Groups.** Vera C. Rubin, Deidre A. Hunter, & W. Kent Ford, Jr. 76, 153, 26-A1 (1991)
- HUOVELIN, JUHANI. Broad-Band Linear Polarization in Cool Stars. I. Models and Spatial Effects for Magnetic and Scattering Regions.** Juhani Huovelin & Steven H. Saar. 374, 319, 102-B1 (1991)
- HURFORD, G. J. First Interferometric Observations of Solar Microwave Millisecond Spike Bursts.** Dale E. Gary, G. J. Hurford, & D. J. Fleet. 369, 255, 39-B1 (1991)
- The Microwave Brightness Temperature Spectrum of the Quiet Sun.** H. Zirin, B. M. Baumert, & G. J. Hurford. 370, 779, 58-B12 (1991)
- HURLBURT, NEAL E. Turbulent Compressible Convection.** Fausto Cattaneo, Nicholas H. Brummell, Juri Toomre, Andrea Malagoli, & Neal E. Hurlbut. 370, 282, 50-F10 (1991)
- HURLEY, KEVIN C. X-Ray Echoes from Gamma-Ray Bursts.** Charles D. Dermer, Kevin C. Hurley, & Dieter H. Hartmann. 370, 341, 51-E1 (1991)
- HURT, ROBERT L. The Molecular Structure of a Starburst:**  $^{13}\text{CO}$  in the Nucleus of Maffei 2. Robert L. Hurt & Jean L. Turner. 377, 434, 145-B8 (1991)
- HURWITZ, MARK. The Albedo and Scattering Phase Function of Interstellar Dust and the Diffuse Background at Far-Ultraviolet Wavelengths.** Mark Hurwitz, Stuart Bowyer, & Christopher Martin. 372, 167, 76-A12 (1991)
- Spectroscopic Limits to an Extragalactic Far-Ultraviolet Background.** Christopher Martin, Mark Hurwitz, & Stuart Bowyer. 379, 549, 171-D10 (1991)
- HUSFELD, D. Echelle Spectroscopy of CD -41° 13967: The Young Central Star of a New Planetary Nebula.** James K. McCarthy, R. Michael Rich, S. R. Becker, K. Butler, D. Husfeld, & H. G. Groth. 371, 380, 64-G1 (1991)
- HUT, PIET. Star Cluster Evolution with Primordial Binaries. II. Detailed Analysis.** Steve McMillan, Piet Hut, & Junichiro Makino. 372, 111, 75-D5 (1991)
- On Core Collapse.** Junichiro Makino & Piet Hut. 383, 181, 214-C9 (1991)
- HUTCHINGS, J. B. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.**
- The Near-Infrared Spectra of Low-Mass X-Ray Binaries and Related Objects.** A. P. Cowley, P. C. Schmidtke, D. Crampton, J. B. Hutchings, & M. Bolte. 373, 228, 88-G1 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Ultraviolet Spectra of a Starburst Knot in NGC 1068.** J. B. Hutchings, F. Bruhweiler, A. Boggess, S. R. Heap, D. Ebbets, E. Beaver, E. Rosenblatt, K. Q. Truong, M. Perez, & R. Westmacott. 377, L25, 143-D1 (1991)
- See HEAP, S. R., et al. First Results from the Goddard High-Resolution Spectrograph: Spectroscopic Determination of Stellar Parameters of Melnick 42, an O3f Star in the Large Magellanic Cloud.**
- See COWLEY, A. P., et al. Discovery of a Long-Term Periodic Variation in LMC X-3.**
- HWANG, JAI-CHAN. Perturbations of the Robertson-Walker Space: Multicomponent Sources and Generalized Gravity.** Jai-chan Hwang. 375, 443, 118-C7 (1991)
- Large-Scale Evolution of a Perturbed Universe.** Jai-chan Hwang. 380, 307, 182-B6 (1991)
- Gauge-invariant Joining Conditions for Cosmological Perturbations.** Jai-chan Hwang & Ethan T. Vishniac. 382, 363, 206-B1 (1991)
- IBÁÑEZ, J. Conformally Symmetric Spheres in the Thin Wall Approximation: Erratum.** L. Herrera, J. Ibáñez, & A. Di Prisco. 376, 367, 129-D12 (1991) (Orig. paper in 353, 579, 71-B4 (1990))
- The Effects of Thermal Radiation on Some General Relativistic Stellar Models.** J. M. Aguirregabiria, J. Ibáñez, A. Di Prisco, & L. Herrera. 376, 662, 134-E8 (1991)
- IBÁÑEZ S., MIGUEL H. On the Thermal Stability of Slabs, Cylinders, and Spheres.** Miguel H. Ibáñez S., & Florencio P. Plachco M. 370, 743, 57-F1 (1991)
- IBEN, IKO, JR. Helium Star Cataclysmics.** Icko Iben, Jr., & Alexander V. Tutukov. 370, 615, 56-B5 (1991)
- Single and Binary Star Evolution.** Icko Iben, Jr. 76, 55, 24-G3 (1991)
- Shell Helium Burning in Low-Mass Stars. I. Models in Thermal Equilibrium.** Masayuki Y. Fujimoto & Icko Iben, Jr. 374, 631, 107-A1 (1991)
- Diffusion and Mixing in Classical Nova Precursors.** Icko Iben, Jr., Masayuki Y. Fujimoto, & Jim MacDonald. 375, L27, 117-D1 (1991)
- ICHIHASHI, KOKI. The Rosseland Mean Free-Free Gaunt Factor of the Dense High-Temperature Stellar Plasma.** Naoki Itoh, Fumiyoji Kuwashima, Koki Ichihashi, & Haruhiko Mutoh. 382, 636, 209-E1 (1991)
- ICHIMARU, S. The Shear Modulus of the Neutron Star Crust and Nonradial Oscillations of Neutron Stars.** T. Strohmayer, S. Ogata, H. Iyetomi, S. Ichimaru, & H. M. Van Horn. 375, 679, 121-B7 (1991)
- ICHIMARU, SETSUO. Nuclear Reaction Rates in Dense Carbon-Oxygen Mixtures.** Shuji Ogata, Hiroshi Iyetomi, & Setsuo Ichimaru. 372, 259, 77-B9 (1991)
- Thermonuclear Reactions in Dense Stellar Matter: Electron Screening Revisited.** Setsuo Ichimaru & Shuji Ogata. 374, 647, 107-B5 (1991)
- IGASHIRA, M. Measurement of the Neutron Capture Rate of the  $^{12}\text{C}(n,\gamma)^{13}\text{C}$  Reaction at Stellar Energy.** Y. Nagai, M. Igashira, K. Takeda, N. Mukai, S. Motoyama, F. Uesawa, H. Kitazawa, & T. Fukuda. 372, 683, 84-B7 (1991)

- See NAGAI, Y., et al. Capture Rate of the  $^7\text{Li}(n, \gamma)^8\text{Li}$  Reaction by Prompt Gamma-Ray Detection.
- IGLESIAS, C. A. Opacities for the Solar Radiative Interior. *C. A. Iglesias & F. J. Rogers*. 371, 408, 65-C1 (1991)
- IGLESIAS, CARLOS A. Opacity Tables for Cepheid Variables. *Carlos A. Iglesias & Forrest J. Rogers*. 371, L73, 73-D1 (1991)
- IGLESIAS, M. E. Be Stars: Chromospheres and Cool Envelopes and Their Relation to Magnetic Fields. *A. E. Ringuelet & M. E. Iglesias*. 369, 463, 43-D10 (1991)
- IDA, MINORU. Laboratory Detection of  $\text{HC}_9\text{N}$  Using a Fourier Transform Microwave Spectrometer. *Minoru Iida, Yasuhiro Ohshima, & Yasuki Endo*. 371, L45, 66-F7 (1991)
- IKEUCHI, SATORU. What Determines the Physical Quantities of Galaxies? A Two-Component Gas Model for Protogalaxies with Energy Input from Supernovae. *Satoru Ikeuchi & Colin A. Norman*. 375, 479, 118-F9 (1991)
- Gravitational Lensing and the Lyman-Alpha Forest. *Satoru Ikeuchi & Edwin L. Turner*. 375, 499, 119-A5 (1991)
- The Evolution of the Diffuse Cosmic Ultraviolet Background Constrained by *Hubble Space Telescope* Observations of 3C 273. *Satoru Ikeuchi & Edwin L. Turner*. 381, L1, 194-A9 (1991)
- ILLINGWORTH, GARTH. The Ordered Nature of Elliptical Galaxies: Implications for Their Intrinsic Angular Momenta and Shapes. *Marijn Franx, Garth Illingworth, & Tim de Zeeuw*. 383, 112, 213-D7 (1991)
- IMAMURA, JAMES N. Noise-driven Radiative Shocks: A New Model for the Optical Quasi-periodic Oscillations of the AM Herculis Objects. *Michael T. Wolff, Kent S. Wood, & James N. Imamura*. 375, L31, 117-D6 (1991)
- The Optical Emission from Oscillating White Dwarf Radiative Shock Waves. *James N. Imamura, Hussain Rashed, & Michael T. Wolff*. 378, 665, 160-F5 (1991)
- High-Speed Multicolor Photometry of V834 Centaurus. *John Middleditch, James N. Imamura, Michael T. Wolff, & Thomas Y. Steiman-Cameron*. 382, 315, 204-B1 (1991)
- IMEYER, C. D. Optical Polarization of a Complete Sample of Radio Sources. *C. D. Impey, C. R. Lawrence, & S. Tapia*. 375, 46, 111-E10 (1991)
- IMEYER, CHRISTOPHER D. Extremely Low Surface Brightness Galaxies in the Fornax Cluster: Properties, Stability, and Luminosity Fluctuations. *Gregory D. Bothun, Christopher D. Impey, & David F. Malin*. 376, 404, 131-D10 (1991)
- INGUSCIO, M. Far-Infrared Fourier Transform Spectroscopy of  $^{12}\text{C}^{18}\text{O}$ . *P. De Natale, M. Inguscio, C. Rois Orza, & L. R. Zink*. 370, L53, 53-G5 (1991)
- INGUSCIO, MASSIMO. Pure Rotational Spectrum of Hydrogen Deutide by Far-Infrared Fourier Transform Spectroscopy. *Lorenzo Ulivi, Paolo De Natale, & Massimo Inguscio*. 378, L29, 157-D7 (1991)
- INOUE, H. See Kit, T., et al. X-Ray Continuum and Evidence for an Iron Emission Line from the Quasar E1821+643.
- See TAN, J., et al. Changes in the 11 Minute Period of 4U 1820-30.
- IOVINO, ANGELA. Scale-invariant Clustering in the Large-Scale Distribution of Galaxies. *Luigi Guzzo, Angela Iovino, Guido Chincarini, Riccardo Giovanelli, & Martha P. Haynes*. 382, L5, 205-B1 (1991)
- IP, W.-H. Densities and Abundances of Hot Cometary Ions in the Coma of P/Halley. *M. Neugebauer, R. Goldstein, B. E. Goldstein, S. A. Fuselier, H. Balsiger, & W.-H. Ip*. 372, 291, 77-E6 (1991)
- Observations of Solar Wind Ion Charge Exchange in the Comet Halley Coma. *S. A. Fuselier, E. G. Shelley, B. E. Goldstein, R. Goldstein, M. Neugebauer, W.-H. Ip, H. Balsiger, & H. Rehm*. 379, 734, 173-G8 (1991)
- IPSER, JAMES R. The Oscillations of Rapidly Rotating Newtonian Stellar Models. II. Dissipative Effects. *James R. Ipser & Lee Lindblom*. 373, 213, 88-E12 (1991)
- On the Adiabatic Pulsations of Accretion Disks and Rotating Stars. *James R. Ipser & Lee Lindblom*. 379, 285, 166-E7 (1991)
- IRELAND, TREVOR R. Isotopically Anomalous Ti in Presolar SiC from the Murchison Meteorite. *Trevor R. Ireland, Ernst K. Zinner, & Sachiko Amari*. 376, L53, 137-D7 (1991)
- IRVINE, W. M. Nitric Oxide in Star-forming Regions: Further Evidence for Interstellar N-O Bonds. *L. M. Ziurys, D. McGonagle, Y. Minh, & W. M. Irvine*. 373, 535, 94-E11 (1991)
- IRVINE, WILLIAM M. See OHISHI, MASATOSHI, et al. Detection of a New Carbon-Chain Molecule, CCO.
- IRWIN, ALAN W. On Equation of State Interpolation Errors in Stellar Interior Calculations. *Ben Dorman, Alan W. Irwin, & Brian B. Pedersen*. 381, 228, 191-G4 (1991)
- IRWIN, JUDITH A. The Neutral Hydrogen Distribution of NGC 3079. *Judith A. Irwin & E. R. Sequist*. 371, 111, 61-D9 (1991)
- IRWIN, MICHAEL J. A Wide-Field Multicolor Survey for High-Redshift Quasars,  $z \geq 2.2$ . I. Photometric Catalog and Survey Selection Function. *Stephen J. Warren, Paul C. Hewett, Michael J. Irwin, & Patrick S. Ossen*. 76, 1, 24-B1 (1991)
- ISAACMAN, R. B. See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a  $7^\circ$  Beam by the *Cosmic Background Explorer* (COBE).
- ISENBERG, P. A. A Catastrophe Mechanism for Coronal Mass Ejections. *T. G. Forbes & P. A. Isenberg*. 373, 294, 89-F1 (1991)
- ISERN, JORDI. The Outcome of Explosive Ignition of ONeMg Cores: Supernovae, Neutron Stars, or "Iron" White Dwarfs? *Jordi Isern, Ramon Canal, & Javier Labay*. 372, L83, 85-D9 (1991)
- ISHIDA, M. Ginga Observation of an AM Herculis Type Source H0538+608. *M. Ishida, A. Silber, H. V. Bradt, R. A. Remillard, K. Makishima, & T. Ohashi*. 367, 270, 15-D6 (1991)
- ISHIGURO, MASATO. A Finger-like Extension of the 20 Kilometer per Second Cloud toward the Galactic Center. *Sachiko K. Okumura, Masato Ishiguro, Edward B. Fomalont, Teisuo Hasegawa, Takashi Kasuga, Koh-Ichiro Morita, Ryohei Kawabe, & Hideyuki Kobayashi*. 378, 127, 152-E9 (1991)
- Aperture Synthesis CS(2-1) Observations of a Young Stellar Object GL 490: Accretion Flow in Gas Disk. *Akiko Nakamura, Ryohei Kawabe, Yoshimi Kitamura, Masato Ishiguro, Yasuhiro Murata, & Nagayoshi Ohashi*. 383, L81, 226-F5 (1991)
- ISHIHARA, HIDEKI. Anisotropies of the Cosmic Background Radiation by Domain Wall Networks. *Yasusada Nambu, Hideki Ishihara, Naoteru Gouda, & Naoshi Sugiyama*. 373, L35, 97-A11 (1991)
- ISHIKAWA, SHIN-ICHI. See OHISHI, MASATOSHI, et al. Detection of a New Carbon-Chain Molecule, CCO.
- ISRAEL, F. P. Molecular Gas Excitation in NGC 253. *W. F. Wall, D. T. Jaffe, F. P. Israel, & F. N. Bash*. 380, 384, 183-A11 (1991)
- A Complete CO Survey of M31. *E. Koper, T. M. Dame, F. P. Israel, & P. Thaddeus*. 383, L11, 219-B7 (1991)
- ISRAELIT, MARK. Perturbations in a Singularity-free Cosmological Model. *Mark Israelit & Nathan Rosen*. 375, 463, 118-E1 (1991)
- Perturbations in a Singularity-free Cosmological Model. II. The Synchronous Gauge. *Mark Israelit*. 375, 473, 118-F1 (1991)
- ITO, K. High-Resolution Absorption Cross Sections of Carbon Monoxide Bands at 295 K between 91.7 and 100.4 Nanometers. *G. Stark, K. Yoshino, Peter L. Smith, K. Ito, & W. H. Parkinson*. 369, 574, 44-G13 (1991)
- ITO, N. See ADARKAR, H., et al. Search for High-Energy Neutrinos from Celestial Sources in the Kolar Gold Fields Experiment.
- ITO, NAOKI. The Roseland Mean Free-Free Gaunt Factor of the Dense High-Temperature Stellar Plasma. *Naoki Itoh, Fumiyoishi Kuwashima, Koki Ichihashi, & Haruhiko Mutoh*. 382, 636, 209-E1 (1991)
- IWATA, T. See KOYAMA, K., et al. An X-Ray Pulsator in the Direction of Molecular Cloud MBM 12 (Lynds 1457).
- IWATA, TAKAHIRO. A Millimeter-Wave Line Study of L1287: A Case of Induced Star Formation by Stellar Wind Compression? *Ji Yang, Tomofumi Umemoto, Takahiro Iwata, & Yasuo Fukui*. 373, 137, 87-F7 (1991)
- IYE, MASANORI. A Catalog of Spin Orientation of Southern Galaxies. *Masanori Iye & Hajime Sugai*. 374, 112, 99-D3 (1991)
- IYETOMI, H. The Shear Modulus of the Neutron Star Crust and Nonradial Oscillations of Neutron Stars. *T. Strohmayer, S. Ogata, H. Iyetomi, S. Ichimaru, & H. M. Van Horn*. 375, 679, 121-B7 (1991)
- IYETOMI, HIROSHI. Nuclear Reaction Rates in Dense Carbon-Oxygen Mixtures. *Shuji Ogata, Hiroshi Iyetomi, & Setsuo Ichimaru*. 372, 259, 77-B9 (1991)
- IZVEKOVA, VERA A. Microstructure-determined Pulsar Dispersion Measures and the Problem of Profile Alignment. *Timothy H.*

- Hankins, Vera A. Izvekova, Valerii M. Malofeev, Joanna M. Rankin, Yuri P. Shitov, & Daniel R. Stinebring. 373, L17, 91-C1 (1991)
- JAAG, S. The *s*-Process Branchings at  $^{185}\text{W}$  and  $^{186}\text{Re}$ . *F. Käppeler, S. Jaag, Z. Y. Bao, & G. Reffo.* 366, 605, 10-E5 (1991)
- JACKSON, J. A Survey of the 158 Micron [C II] Fine-Structure Line in the Central 50 Parsecs of The Galaxy. *A. Poglitsch, G. J. Stacey, N. Geis, M. Haggerty, J. Jackson, M. Rumitz, R. Genzel, & C. H. Townes.* 374, L33, 110-B5 (1991)
- JACKSON, J. M. The Molecular Interstellar Medium and the Near-Infrared Continuum of the Barred LINER NGC 6764. *A. Eckart, M. Cameron, J. M. Jackson, R. Genzel, A. I. Harris, W. Wild, & H. Zinnecker.* 372, 67, 74-G9 (1991)
- The Optical Depth of the 158 Micron [ $^{12}\text{C}$  II] Line: Detection of the  $F = 1 \rightarrow 0$  [ $^{13}\text{C}$  II] Hyperfine-Structure Component. *G. J. Stacey, C. H. Townes, A. Poglitsch, S. C. Madden, J. M. Jackson, F. Herrmann, R. Genzel, & N. Geis.* 382, L37, 205-E1 (1991)
- JACKSON, JAMES M. The Interstellar Medium of the Hot-Spot Galaxy NGC 2903. *James M. Jackson, Andreas Eckart, Murray Cameron, Wolfgang Wild, Paul T. P. Ho, Richard W. Pogge, & Andrew I. Harris.* 375, 105, 112-C9 (1991)
- JACKSON, P. D. See SMOOT, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- JACOBY, GEORGE H. Central Star Temperatures of Low-Excitation Planetary Nebulae. *James B. Kaler & George H. Jacoby.* 372, 215, 76-F1 (1991)
- The Multiple-Shell Structure of the Planetary Nebula NGC 6751. *You-Hua Chu, Arturo Manchado, George H. Jacoby, & Karen B. Kwinter.* 376, 150, 126-F13 (1991)
- Core Masses and Abundances of Low-Excitation Planetary Nebulae in the Magellanic Clouds. *James B. Kaler & George H. Jacoby.* 382, 134, 201-G7 (1991)
- Planetary Nebulae as Standard Candles. VII. A Test versus Hubble Type in the NGC 1023 Group. *Robin Ciardullo, George H. Jacoby, & William E. Harris.* 383, 487, 220-D1 (1991)
- JAFFE, D. T. Parsec-Scale Penetration of Ultraviolet Photons into Molecular Clouds: [C II] 158 Micron Mapping of W3, NGC 1977, and NGC 2023. *J. E. Howe, D. T. Jaffe, R. Genzel, & G. J. Stacey.* 373, 158, 88-A5 (1991)
- Molecular Gas Excitation in NGC 253. *W. F. Wall, D. T. Jaffe, F. P. Israel, & F. N. Bash.* 380, 384, 183-A11 (1991)
- JAGOD, MARY-FRANCES. Laboratory Infrared Spectra of  $\text{CH}_2\text{D}^+$  and  $\text{HCCD}^+$  and Predicted Microwave Transitions. *Mathias Rösslein, Mary-Frances Jagod, Charles M. Gabrys, & Takeshi Oka.* 382, L51, 205-F1 (1991)
- JAHODA, KEITH. Cross-Correlation of the X-Ray Background with Nearby Galaxies. *Keith Jahoda, Ofir Lahav, Richard F. Mushotzky, & Elihu Boldt.* 378, L37, 162-D7 (1991)
- JAKOBSEN, P. See MACCHETTO, F., et al. First Results from the Faint Object Camera: Observations of PKS 0521-36.
- See CRANE, P., et al. First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305.
- First Results from the Faint Object Camera: SN 1987A. *P. Jakobsen, R. Albrecht, C. Barbieri, J. C. Blades, A. Boksenberg, P. Crane, J. M. Deharveng, M. J. Disney, T. M. Kamperman, I. R. King, F. Macchetto, C. D. Mackay, F. Paresce, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, W. B. Sparks, R. P. Kirshner, & N. Panagia.* 369, L63, 46-B1 (1991)
- See PARESCHE, F., et al. First Results from the Faint Object Camera: Imaging the Core of R Aquarii.
- See MACCHETTO, F., et al. HST Observations of 3C 66B: A Double-stranded Optical Jet.
- See ALBRECHT, R., et al. First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System.
- See WEIGELT, G., et al. First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.
- JAKOBSEN, PETER. Faint Object Camera Observations of a Globular Cluster Nova Field. *Bruce Margon, Scott F. Anderson, Ronald A. Downes, Ralph C. Bohlin, & Peter Jakobsen.* 369, L71, 46-C1 (1991)
- JAMES, G. K. Collisional Excitation and Radiative Properties of  $\text{N II}$ : The Strong Intercombination ( ${}^1\text{D}-{}^3\text{P}^0$ ) Transition at 748 Å. *T. M. Tripp, D. E. Shemansky, G. K. James, & J. M. Ajello.* 368, 641, 33-B6 (1991)
- Cross Sections for Production of  $\text{H}(2p, 2s, 1s)$  by Electron Collisional Dissociation of  $\text{H}_2$ . *J. M. Ajello, D. E. Shemansky, & G. K. James.* 371, 422, 65-D5 (1991)
- JAMES, P. A. The Effect of Inclination-dependent Selection on IRAS Galaxy Detection Rates. *A. J. Connolly, R. D. Joseph, & P. A. James.* 370, 140, 48-G6 (1991)
- JAMINET, P. A. Molecular Line Survey of Sagittarius B2(M) from 330 to 355 GHz and Comparison with Sagittarius B2(N). *E. C. Sutton, P. A. Jaminet, W. C. Danchi, & Geoffrey A. Blake.* 77, 255, 47-F1 (1991)
- $\text{CO } J = 3-2$  and  $J = 2-1$  Observations of NGC 7027. *P. A. Jaminet, W. C. Danchi, E. C. Sutton, A. P. G. Russell, Göran Sandell, J. H. Bieging, & D. W. Wilner.* 380, 461, 184-A4 (1991)
- JANES, KENNETH A. Radial Velocity Measurements in the Pleiades. *T. Liu, Kenneth A. Janes, & T. M. Bania.* 377, 141, 139-F7 (1991)
- JANNUZI, B. T. The Ultraviolet Absorption Spectrum of 3C 273. *J. N. Bahcall, B. T. Jannuzzi, D. P. Schneider, G. F. Hartig, R. Bohlin, & V. Junkkarinen.* 377, L5, 143-B6 (1991)
- JANNUZI, BUELL T. Detection of Polarized Ultraviolet Emission from the High-Redshift Radio Galaxy 3C 265. *Buell T. Jannuzzi & Richard Elston.* 366, L69, 11-C5 (1991)
- UBVRI Photometry of Stars in the Fields of X-Ray Selected BL Lacertae Objects. *Paul S. Smith, Buell T. Jannuzzi, & Richard Elston.* 77, 67, 44-D1 (1991)
- JANOT-PACHECO, E. Accretion Mechanisms in the Be/X-Ray Transient System A0535+26. *C. Motch, L. Stella, E. Janot-Pacheco, & M. Mouchez.* 369, 490, 43-G5 (1991)
- JANSSEN, M. See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a 7° Beam by the *Cosmic Background Explorer* (COBE).
- JANSSEN, M. A. See SMOOT, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- JAWORSKI, WAYNE A. Analysis of the Swings Effect and Greenstein Effect in Comet P/Halley. *Wayne A. Jaworski & Jeremy B. Tatum.* 377, 306, 141-F11 (1991)
- JEDRZEJEWSKI, R. See MACCHETTO, F., et al. First Results from the Faint Object Camera: Observations of PKS 0521-36.
- See CRANE, P., et al. First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305.
- See JAKOBSEN, P., et al. First Results from the Faint Object Camera: SN 1987A.
- See PARESCHE, F., et al. First Results from the Faint Object Camera: Imaging the Core of R Aquarii.
- See MACCHETTO, F., et al. HST Observations of 3C 66B: A Double-stranded Optical Jet.
- See ALBRECHT, R., et al. First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System.
- See WEIGELT, G., et al. First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.
- JEFFERIES, J. T. Submillimeter Solar Limb Profiles Determined from Observations of the Total Solar Eclipse of 1988 March 18. *T. L. Roellig, E. E. Becklin, J. T. Jefferies, G. A. Kopp, C. A. Lindsey, F. Q. Orrall, & M. W. Werner.* 381, 288, 192-E5 (1991)
- JEFFERIES, JOHN T. On the Inference of Magnetic Field Vectors from Stokes Profiles. *John T. Jefferies & Donald L. Mickey.* 372, 694, 84-C9 (1991)
- The Solar Mg I Spectrum from ATMOS. I. Identification and Preliminary Discussion. *John T. Jefferies.* 377, 337, 142-B5 (1991)
- The Solar Chromospheric Supergranular Network in 850 Micron Radiation. *Charles A. Lindsey & John T. Jefferies.* 383, 443, 217-G1 (1991)
- JEFFERIES, S. M. Measurements of High-Frequency Solar Oscillation Modes. *T. L. Duvall, Jr., J. W. Harvey, S. M. Jefferies, & M. A. Pomerantz.* 373, 308, 89-G1 (1991)
- Characteristics of Intermediate-Degree Solar  $p$ -Mode Line Widths. *S. M. Jefferies, T. L. Duvall, Jr., J. W. Harvey, Y. Osaki, & M. A. Pomerantz.* 377, 330, 142-A11 (1991)
- JEFFERY, DAVID J. Analysis of SN 1987A Polarimetry. *David J. Jeffery.* 375, 264, 114-C5 (1991)

- The Near-Maximum-Light Spectrum of the Type Ic Supernova 1987M.** *David J. Jeffery, David Branch, Alexei V. Filippenko, & Ken'ichi Nomoto.* 377, L89, 150-D10 (1991)
- Catalog of SN 1987A Polarimetry Corrected for Interstellar Polarization.** *David J. Jeffery.* 77, 405, 50-B5 (1991)
- JEFFREYS, W. H.** See FRANZ, O. G., et al. Binary Star Observations with the *Hubble Space Telescope* Fine Guidance Sensors. I. ADS 11300.
- A Statistical Study of the Correlation of Galactic Supernova Remnants and Spiral Arms.** *Zongwei Li, J. Craig Wheeler, Frank N. Bash, & W. H. Jefferys.* 378, 93, 152-B9 (1991)
- JEFFERYS, WILLIAM H.** Absolute Magnitudes and Kinematic Properties of Cepheids. *Teresa D. Wilson, Thomas G. Barnes III, Suzanne L. Hawley, & William H. Jefferys.* 378, 708, 161-B11 (1991)
- JENKINS, EDWARD B.** Ultraviolet Interstellar Lines in the Spectrum of  $\pi$  Scorpii Recorded at 2 Kilometers per Second Resolution. *Charles L. Joseph & Edward B. Jenkins.* 368, 201, 25-E9 (1991)
- Lyman-Alpha Depression of the Continuum from High-Redshift Quasars: A New Technique Applied in Search of the Gunn-Peterson Effect. *Edward B. Jenkins & Jeremiah P. Ostriker.* 376, 33, 125-D9 (1991)
- JENNINGS, D. E.** CN and HCN in the Infrared Spectrum of IRC +10216. *G. R. Wiedemann, Kenneth H. Hinkle, John J. Keady, D. Deming, & D. E. Jennings.* 382, 321, 204-B10 (1991)
- JENNINGS, D. G.** See AKERLOF, C. W., et al. Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy.
- JENNINGS, DONALD E.** Detection of  $^{13}\text{C}$ -Ethane in Jupiter's Atmosphere. *Günter Wiedemann, Gordon L. Björaker, & Donald E. Jennings.* 383, L29, 219-D7 (1991)
- JERNIGAN, GARRETT** High Angular Resolution Broad-Band Imaging in the Mid-Infrared: The Infrared-bright Galaxy NGC 34. *Eric Keto, Garrett Jernigan, Roger Ball, John Arens, & Margaret Meixner.* 374, L29, 110-B1 (1991)
- JOG, CHANDA J.** H I Deficiency in Cluster Spiral Galaxies: Dependence on Galaxy Size. *Monica Valluri & Chanda J. Jog.* 374, 103, 99-C7 (1991)
- The Velocity Dispersion of Giant Molecular Clouds. II. Mathematical and Numerical Refinements.** *Charles F. Gammie, Jeremiah P. Ostriker, & Chanda J. Jog.* 378, 565, 159-D5 (1991)
- JOHANNESSEN, A.** High-Resolution Spectra of Solar Magnetic Features. II. Magnetic Fields of Umbral Brightenings. *Bruce W. Lites, Thomas A. Bida, A. Johansson, & G. B. Scharmer.* 373, 683, 96-D11 (1991)
- JOHANSSON, SVENERIC** Ultraviolet High-Excitation Fe II Fluorescence Lines Excited by O VI, C IV, and H I Resonance Emission As Seen in IUE Spectra. *Walter A. Feibelman, Frederick C. Bruhwiler, & Sveneric Johansson.* 373, 649, 96-A8 (1991)
- JOHANSSON, SVENERIC G.** First Results from the Goddard High-Resolution Spectrograph: High-Resolution Observations of the 1942 Å Resonance Line of Hg II in the Chemically Peculiar B Star,  $\chi$  Lupi. *David S. Leckrone, Glenn M. Wahlgren, & Sveneric G. Johansson.* 377, L37, 143-E1 (1991)
- JOHNSON, DEAN R. H.** The Chromospheric Emission-Age Relation for Stars of the Lower Main Sequence and Its Implications for the Star Formation Rate. *David R. Soderblom, Douglas K. Duncan, & Dean R. H. Johnson.* 375, 722, 121-F5 (1991)
- JOHNSON, HOLLIS R.** An Interactive Companion to the S Star HD 35155. *Thomas B. Ake III, Hollis R. Johnson, & Mudhaffer M. Ameen.* 383, 842, 224-F7 (1991)
- JOHNSON, R. E.** Desorption of Large Molecules from Grains in Dense Interstellar Clouds. *R. E. Johnson, V. Pirronello, B. Sundqvist, & B. Donn.* 379, L75, 175-D12 (1991)
- JOHNSTON, HELEN M.** On the Detectability of Pulsars in Close Binary Systems. *Helen M. Johnston & Shrinivas R. Kulkarni.* 368, 504, 31-D1 (1991)
- Deep VLA Images of Globular Clusters.** *Helen M. Johnston, Shrinivas R. Kulkarni, & W. M. Goss.* 382, L89, 211-D11 (1991)
- JOHNSTON, K. J.** See QUIRRENBACH, A., et al. Correlated Radio and Optical Variability in the BL Lacertae Object 0716+714.
- NGC 7538 IRS 1:** Subarcsecond Resolution Recombination Line and  $^{15}\text{NH}_3$  Maser Observations. *R. A. Gaume, K. J. Johnston, H. A. Nguyen, T. L. Wilson, H. R. Dickel, W. M. Goss, & M. C. H. Wright.* 376, 608, 133-G12 (1991)
- Daily Observations of Compact Radio Sources at 2.7 and 8.1 GHz: 1979-1987.** *E. B. Waltman, R. L. Fielder, K. J. Johnston, J. H. Spencer, D. R. Florkowski, F. J. Josties, D. D. McCarthy, & D. N. Matsakis.* 77, 379, 49-G5 (1991)
- JOKIPPI, J. R.** Heliospheric Effects on Cosmic-Ray Electrons. *H. Moraal, J. R. Jokipii, & R. A. Mewaldt.* 367, 191, 14-D8 (1991)
- Viscosity and Inertia in Cosmic-Ray Transport: Effects of an Average Magnetic Field. *L. L. Williams & J. R. Jokipii.* 371, 639, 69-E3 (1991)
- JONCAS, GILLES** Superbubble Blowout in the Giant H II Region NGC 2363? *Jean-René Roy, J. Boulesteix, Gilles Joncas, & B. Grundseth.* 367, 141, 13-F8 (1991)
- JONES, BURTON F.** HH 5, HH 6, and Their Exciting Stars. *Martin Cohen, Burton F. Jones, & Mark Hereld.* 371, 237, 63-B1 (1991)
- JONES, C.** Evolution of the Interstellar Medium in Elliptical Galaxies. II. X-Ray Properties. *L. P. David, W. Forman, & C. Jones.* 369, 121, 37-D9 (1991)
- Ram-Pressure Stripping of the Multiphase Interstellar Medium of the Virgo Cluster Elliptical Galaxy M86 (NGC 4406). *David A. White, A. C. Fabian, W. Forman, C. Jones, & C. Stern.* 375, 35, 111-D9 (1991)
- Do Clusters of Galaxies Affect the Spectrum of the Microwave Background? *M. Markevitch, G. R. Blumenthal, W. Forman, C. Jones, & R. A. Sunyaev.* 378, L33, 162-D1 (1991)
- Enrichment and Heating of the Intracluster Medium through Galactic Winds. *L. P. David, W. Forman, & C. Jones.* 380, 39, 176-E1 (1991)
- JONES, CHRISTINE** Interstellar Matter in Early-Type Galaxies. I. The Catalog. *Morton S. Roberts, David E. Hogg, Joel N. Bregman, William R. Forman, & Christine Jones.* 75, 751, 11-F5 (1991)
- JONES, D.** Interstellar Photodissociation and Photoionization Rates. *W. G. Robege, D. Jones, S. Lepp, & A. Dalgarno.* 77, 287, 48-B1 (1991)
- JONES, P. B.** Rotation of the Neutron-Drip Superfluid in Pulsars: The Interaction and Pinning of Vortices. *P. B. Jones.* 373, 208, 88-E6 (1991)
- JONES, W. V.** Measurement of Cosmic-Ray Proton and Helium Spectra during the 1987 Solar Minimum. *E. S. Seo, J. F. Ormes, R. E. Streitmatter, S. J. Stochaj, W. V. Jones, S. A. Stephens, & T. Bowen.* 378, 763, 161-G1 (1991)
- JORDAN, C.** Fe II Emission Lines. I. Chromospheric Spectra of Red Giants. *P. G. Judge & C. Jordan.* 77, 75, 44-E1 (1991)
- JORDEN, P. R.** Multiwavelength Isophotal Data for Southern Elliptical Galaxies. *W. B. Sparks, J. V. Wall, P. R. Jorden, D. J. Thorne, & I. van Breda.* 76, 471, 31-F11 (1991)
- JOSEPH, CHARLES L.** Ultraviolet Interstellar Lines in the Spectrum of  $\pi$  Scorpii Recorded at 2 Kilometers per Second Resolution. *Charles L. Joseph & Edward B. Jenkins.* 368, 201, 25-E9 (1991)
- JOSEPH, R. D.** The Effect of Inclination-dependent Selection on IRAS Galaxy Detection Rates. *A. J. Connolly, R. D. Joseph, & P. A. James.* 370, 140, 48-G6 (1991)
- Infrared Emission Regions in the Interacting Galaxy System Arp 299. *C. G. Wynne-Williams, S. A. Eales, E. E. Becklin, K.-W. Hodapp, R. D. Joseph, I. S. McLean, D. A. Simons, & G. S. Wright.* 377, 426, 145-A13 (1991)
- JOSEPH, ROBERT D.** Infrared Emissions of  $\text{H}_3^+$  in the Atmosphere of Jupiter in the 2.1 and 4.0 Micron Region: Erratum. *Steven Miller, Robert D. Joseph, & Jonathan Tennyson.* 367, L37, 17-F1 (1991) (Orig. paper in 360, L55, 156-E1 (1990))
- JOSTIES, F. J.** Daily Observations of Compact Radio Sources at 2.7 and 8.1 GHz: 1979-1987. *E. B. Waltman, R. L. Fielder, K. J. Johnston, J. H. Spencer, D. R. Florkowski, F. J. Josties, D. D. McCarthy, & D. N. Matsakis.* 77, 379, 49-G5 (1991)
- JOY, M.** Infrared Mapping of M82: A Starburst in an Edge-on Barred Galaxy. *C. M. Telesco, H. Campins, M. Joy, K. Diez, & R. Decher.* 369, 135, 37-E11 (1991)
- JOY, MARSHALL** Dust Properties around Evolved Stars from Far-Infrared Size Limits. *Paul M. Harvey, Daniel F. Lester, David Brock, & Marshall Joy.* 368, 558, 32-A8 (1991)
- Cooling Flows and the Formation of Massive Halos in cD Galaxies. *Andrea H. Prestwich & Marshall Joy.* 369, L1, 40-A7 (1991)

- JYCO, R. R. Near-Infrared Long-Slit Spectra of NGC 1068. *M. Tamura, S. G. Kleinmann, N. Z. Scoville, & R. R. Joyce.* 371, 131, 61-F3 (1991)
- Infrared Polarization Images of Star-forming Regions. I. The Ubiquity of Bipolar Structure. *M. Tamura, Ian Gailey, R. R. Joyce, M. Ueno, H. Suto, & M. Sekiguchi.* 378, 611, 160-A1 (1991)
- JUDA, M. Limits on the Density of Neutral Gas within 100 Parsecs from Observations of the Soft X-Ray Background. *M. Juda, J. J. Bloch, B. C. Edwards, D. McCammon, W. T. Sanders, S. L. Snowden, & J. Zhang.* 367, 182, 14-C8 (1991)
- JUDGE, P. G. Evolution of the Chromospheres and Winds of Low- and Intermediate-Mass Giant Stars. *P. G. Judge & R. E. Stencel.* 371, 357, 64-E3 (1991)
- Fe II Emission Lines. I. Chromospheric Spectra of Red Giants. *P. G. Judge & C. Jordan.* 77, 75, 44-E1 (1991)
- JUNG, YOUNG-DAE. The Energies and Structure of X-Ray K-Absorption Edges. *Robert J. Gould & Young-Dae Jung.* 373, 271, 89-D1 (1991)
- JUNKKARINEN, V. The Ultraviolet Absorption Spectrum of 3C 273. *J. N. Bahcall, B. T. Jannuzi, D. P. Schneider, G. F. Hartig, R. Bohlin, & V. Junkkarinen.* 377, L5, 143-B6 (1991)
- A Catalog of Absorption in the Spectra of Quasi-stellar Objects. *V. Junkkarinen, A. Hewitt, & G. Burbidge.* 77, 203, 47-B1 (1991)
- JUNKKARINEN, VESA T. A Technique for Using Radio Jets as Extended Gravitational Lensing Probes. *Philipp P. Kronberg, Charles C. Dyer, E. Margaret Burbidge, & Vesa T. Junkkarinen.* 367, L1, 17-B1 (1991)
- See BEAVER, E. A., et al. Far-Ultraviolet Spectroscopy of the Quasar UM 675 with the Faint Object Spectrograph on the *Hubble Space Telescope*.
- JURA, M. Nitrogen Abundances in Carbon-rich Stars That Are Progenitors to Planetary Nebulae. *M. Jura.* 372, 208, 76-E7 (1991)
- The Dust Debris around HR 4796. *M. Jura.* 383, L79, 226-F1 (1991)
- KÄPPELER, F. The s-Process Branchings at  $^{185}\text{W}$  and  $^{186}\text{Re}$ . *F. Käppeler, S. Jaag, Z. Y. Bao, & G. Reffo.* 366, 605, 10-E5 (1991)
- A Measurement of the  $^{22}\text{Ne}(n, \gamma)^{23}\text{Ne}$  Capture Cross Section at a Stellar Temperature of  $kT = 25$  keV. *Hermann Beer, G. Rupp, F. Voss, & F. Käppeler.* 379, 420, 168-C1 (1991)
- KAFATOS, M. Ultraviolet and Optical Spectroscopy of the R Aquarii Symmetrical Jet. *J. M. Hollis, R. J. Oliversen, M. Kafatos, A. G. Michalitsianos, & R. M. Wagner.* 377, 227, 140-F1 (1991)
- KAFATOS, MENAS. Forbidden Lines of  $np^q$  Ions. II. Line Intensities. *John P. Lynch & Menas Kafatos.* 76, 1169, 41-F7 (1991)
- KAHLER, S. High Coronal Flares and Impulsive Acceleration of Solar Energetic Particles. *E. Cliver & S. Kahler.* 366, L91, 11-E11 (1991)
- Coronal Mass Ejections and Streamers Associated with the New Cycle Active Regions at Solar Minimum. *S. Kahler.* 378, 398, 155-G9 (1991)
- KAHN, S. M. The Einstein Objective Grating Spectrometer Survey of Galactic Binary X-Ray Sources. *S. D. Vrilek, J. E. McClintock, F. D. Seward, S. M. Kahn, & B. J. Wargelin.* 76, 1127, 41-C1 (1991)
- KAHN, STEVEN M. Bowen Fluorescence in AM Herculis Stars. *Jonathan Schachter, Alexei V. Filippenko, Steven M. Kahn, & Frits B. S. Paerels.* 373, 633, 95-G4 (1991)
- KAIFU, N. A Spectroscopic Study of the DR 21 Outflow Source. III. The CO Line Emission. *R. P. Garden, M. Hayashi, I. Gatley, T. Hasegawa, & N. Kaifu.* 374, 540, 105-G11 (1991)
- KAIFU, NORIO. The Dense, Inner Part of the Protostellar Disk: Protostar Candidates in GGD 27 IRS. *Takuya Yamashita, Yasuhiro Murata, Ryohei Kawabe, Norio Kaifu, & Motohide Tamura.* 373, 560, 95-A1 (1991)
- Molecular Observations of the L723 Region: Interaction between the Clumpy Outflow and the Gaseous Core? *Saeko S. Hayashi, Tetsuo Hasegawa, & Norio Kaifu.* 377, 492, 145-G5 (1991)
- See OHISHI, MASATOSHI, et al. Detection of a New Carbon-Chain Molecule, CCO.
- KAISER, MARY ELIZABETH. The Interstellar  $^{12}\text{CN}/^{13}\text{CN}$  Ratio toward  $\zeta$  Persei. *Mary Elizabeth Kaiser, Isabel Hawkins, & Edward L. Wright.* 379, 267, 166-D1 (1991)
- KAISER, N. Excursion Set Mass Functions for Hierarchical Gaussian Fluctuations. *J. R. Bond, S. Cole, G. Efstathiou, & N. Kaiser.* 379, 440, 170-C1 (1991)
- Power-Spectrum Analysis of One-dimensional Redshift Surveys. *N. Kaiser & J. A. Peacock.* 379, 482, 170-F5 (1991)
- Evolution of Clusters of Galaxies. *N. Kaiser.* 383, 104, 213-C11 (1991)
- KAISER, NICK. Bulk Flows, Shear, and the Great Attractor. *Nick Kaiser.* 366, 388, 7-F1 (1991)
- KAISIG, M. Propagation of Magnetoacoustic Waves in the Solar Atmosphere with Random Inhomogeneities of Density and Magnetic Fields. *M. Ryutova, M. Kaisig, & T. Tajima.* 380, 268, 179-D1 (1991)
- KALCHUKOV, E. F. See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- KALEN, J. D. Primordial  $^4\text{He}$  as a Test of Big Bang Nucleosynthesis. *G. M. Fuller, R. N. Boyd, & J. D. Kalen.* 371, L11, 66-B7 (1991)
- KALER, JAMES B. Central Star Temperatures of Low-Excitation Planetary Nebulae. *James B. Kaler & George H. Jacoby.* 372, 215, 76-F1 (1991)
- Core Masses and Abundances of Low-Excitation Planetary Nebulae in the Magellanic Clouds. *James B. Kaler & George H. Jacoby.* 382, 134, 201-G7 (1991)
- KALLENRODE, M.-B. Particle Injection following Solar Flares on 1980 May 28 and June 8: Evidence for Different Injection Time Histories in Impulsive and Gradual Events? *M.-B. Kallenrode & G. Gibberen.* 376, 787, 136-B8 (1991)
- Multispacecraft Observations of Solar  $^3\text{He}$ -rich Events. *D. V. Reames, M.-B. Kallenrode, & R. G. Stone.* 380, 287, 179-G1 (1991)
- KALLMAN, T. R. The Ultraviolet Spectrum of Scorpius X-1 as Observed by IUE: 1978-1988. *T. R. Kallman, J. C. Raymond, & S. D. Vrilek.* 370, 717, 57-C11 (1991)
- Ultraviolet Variability of NGC 5548: Dynamics of the Continuum Production Region and Geometry of the Broad-Line Region. *J. H. Krolik, Keith Horne, T. R. Kallman, M. A. Malkan, R. A. Edelson, & G. A. Kriss.* 371, 541, 68-C6 (1991)
- KALLMAN, TIMOTHY R. Enhanced Winds and Tidal Streams in Massive X-Ray Binaries. *John M. Blondin, Ian R. Stevens, & Timothy R. Kallman.* 371, 684, 70-B1 (1991)
- The Effects of X-Ray Illumination on Accretion Disk Interiors. *Yuan-Kuen Ko & Timothy R. Kallman.* 374, 721, 108-A10 (1991)
- KALNAJS, AGRIS J. Global Stability of Self-similar Newtonian Gaseous Disks against Axisymmetric Perturbations. *José P. S. Lemos, Agris J. Kalnajs, & Donald Lynden-Bell.* 375, 484, 118-G1 (1991)
- KAMATA, YUICHI. Discovery of Periodic Eclipses in the X-Ray Pulsar 1H 0253+193. *Yuichi Kamata, Yuzuru Tawara, & Katsuji Koyama.* 379, L65, 175-C13 (1991)
- KAMEYA, OSAMU. U-shaped Outflow in the Lynds 1221 Dark Cloud: An Example of Interaction of Outflows with Ambient Molecular Clouds. *Tomofumi Umemoto, Naomi Hirano, Osamu Kameya, Yasuo Fukui, Nario Kuno, & Keiya Takakubo.* 377, 510, 146-A13 (1991)
- KAMIOJO, S. Discovery of a Cyclotron Resonance Feature at 30 keV from the Transient X-Ray Pulsar Cepheus X-4. *T. Mihara, K. Makishima, S. Kamijo, T. Ohashi, F. Nagase, Y. Tanaka, & K. Koyama.* 379, L61, 175-C6 (1991)
- KAMPERMAN, T. M. See MACCHETTO, F., et al. First Results from the Faint Object Camera: Observations of PKS 0521-36.
- See CRANE, P., et al. First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305.
- See JAKOBSEN, P., et al. First Results from the Faint Object Camera: SN 1987A.
- See PARESC, F., et al. First Results from the Faint Object Camera: Imaging the Core of R Aquarii.
- See MACCHETTO, F., et al. HST Observations of 3C 66B: A Double-stranded Optical Jet.
- See ALBRECHT, R., et al. First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System.
- See WEIGELT, G., et al. First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.
- KANAAN, A. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.

- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- KANAMORI, HIDETO. See OHISHI, MASATOSHI, et al. Detection of a New Carbon-Chain Molecule, CCO.
- KANDRUP, HENRY E. On the "Mixing" of Self-gravitating Systems in a Cosmological Context. *Henry E. Kandrup*. 366, 384, 7-E7 (1991)
- A Stability Criterion for Any Collisionless Stellar Equilibrium and Some Concrete Applications Thereof. *Henry E. Kandrup*. 370, 312, 51-B6 (1991)
- On the Sensitivity of the N-Body Problem to Small Changes in Initial Conditions. *Henry E. Kandrup & Haywood Smith, Jr.* 374, 255, 101-C9 (1991)
- The Secular Instability of Axisymmetric Collisionless Star Clusters. *Henry E. Kandrup*. 380, 511, 184-E9 (1991)
- KANE, BRIAN D. Polarimetric Mapping of Orion Using MILLIPOL: Magnetic Activity in BN/KL. *Robert W. Leach, Dan P. Clemens, Brian D. Kane, & Richard Barvainis*. 370, 257, 50-D1 (1991)
- KANG, HO-SHIK. Primordial Nucleosynthesis Redux. *Terry P. Walker, Gary Steigman, David N. Schramm, Keith A. Olive, & Ho-Shik Kang*. 376, 51, 125-F1 (1991)
- KAO, LANCELOT. A Table of Astronomically Important Ro-vibrational Transitions for the H<sub>2</sub><sup>+</sup> Molecular Ion. *Lancelot Kao, Takeshi Oka, Steven Miller, & Jonathan Tennyson*. 77, 317, 48-E1 (1991)
- KAPOHII, VIJAY K. Correlated Radio and Optical Asymmetries in Powerful Radio Sources. *Patrick J. McCarthy, Wil van Breugel, & Vijay K. Kapohii*. 371, 478, 67-D11 (1991)
- KAPLAN, JEAN. A Critical Look at Cosmions. *Jean Kaplan, François Martin de Volnay, Charling Tao, & Sylvaine Turck-Chièze*. 378, 315, 154-G11 (1991)
- KAPOOR, R. C. The Contribution of Light Bending and Redshift to the Pulse Characteristics of a Pulsar in the Case of Smaller Neutron Stars. *R. C. Kapoor*. 378, 227, 153-G1 (1991)
- KAROVSKA, M. Measurements of the Diameter of the Supernova SN 1987A. *M. Karovska, P. Nisenson, C. Standley, & S. R. Heathcote*. 367, L15, 17-C8 (1991)
- Asymmetries in the Atmosphere of Mira. *M. Karovska, P. Nisenson, C. Papaliolios, & R. P. Boyle*. 374, L51, 110-D1 (1991)
- KAROVSKA, MARGARITA. High-Resolution Studies of the Structure of the Solar Atmosphere Using a New Imaging Algorithm. *Margarita Karovska & Shadia Rifai Habbal*. 371, 402, 65-B1 (1991)
- KARPEN, JUDITH T. Coronal Current-Sheet Formation: The Effect of Asymmetric and Symmetric Shears. *Judith T. Karpen, Spiro K. Antiochos, & C. Richard DeVore*. 382, 327, 204-C4 (1991)
- KARTSE, JOHN F. Scattering-induced Optical Polarization in Thick Accretion Disks. *John F. Kartse & Arieh Königl*. 375, 69, 111-G6 (1991)
- KASHLINSKY, A. Gravitational Clustering of Gaussian Density Fluctuations and the Origin of Hierarchy Correlations. *A. Kashlinsky*. 376, L5, 130-B1 (1991)
- Microwave Background Anisotropies Implied by Large-Scale Galaxy Correlations: The Minimum of C(0) and Cosmological Parameters. *A. Kashlinsky*. 383, L1, 219-A7 (1991)
- KASSIM, NAMIR E. A New Look at the "Jet" in the CTB 37A/B Supernova Remnant Complex. *Namir E. Kassim, Stefi A. Baum, & Kurt W. Weiler*. 374, 212, 100-F9 (1991)
- KASSIOLA, AGGELIKI. Bounds on Intergalactic Compact Objects from Observations of Compact Radio Sources. *Aggeliki Kassiola, Israel Kovner, & Roger D. Blandford*. 381, 6, 189-B4 (1991)
- KASTNER, S. O. N III Line Emission in Planetary Nebulae: Not Bowen Fluorescence. *S. O. Kastner & A. K. Bhaia*. 381, L59, 199-D7 (1991)
- KASUGA, TAKASHI. A Finger-like Extension of the 20 Kilometer per Second Cloud toward the Galactic Center. *Sachiko K. Okumura, Masato Ishiguro, Edward B. Fomalont, Tetsuo Hasegawa, Takashi Kasuga, Koh-Ichiro Morita, Ryohei Kawabe, & Hideyuki Kobayashi*. 378, 127, 152-E9 (1991)
- KATO, MARIKO. Theoretical Light Curve for the Recurrent Nova RS Ophiuchi—Determination of the White Dwarf Mass, Composition, and Distance. *Mariko Kato*. 369, 471, 43-E6 (1991)
- Is Drag Luminosity Effective in Recurrent Novae? *Mariko Kato & Izumi Hachisu*. 373, 620, 95-F1 (1991)
- Effects of Drag Luminosity in the Common Envelope Phase of Slow Novae. *Mariko Kato & Izumi Hachisu*. 383, 761, 223-F3 (1991)
- KATO, Y. See MURAKI, Y., et al. Observations of Ultra-High-Energy Photons from Cygnus X-3.
- KATZ, J. I. Universal Particle Acceleration. *J. I. Katz*. 367, 407, 18-E1 (1991)
- V1500 Cygni: A Prediction. *J. I. Katz*. 374, L59, 110-D11 (1991)
- KATZ, N. The Clustering of Faint Galaxies. *G. Efstathiou, G. Bernstein, N. Katz, J. A. Tyson, & P. Guhathakurta*. 380, L47, 188-B1 (1991)
- KATZ, NEAL. Dissipationless Collapse in an Expanding Universe. *Neal Katz*. 368, 325, 29-B4 (1991)
- Dissipative Galaxy Formation. I. Effects of Gasdynamics. *Neal Katz & James E. Gunn*. 377, 365, 144-D1 (1991)
- KAUL, R. K. Possible Detection of TeV Gamma Rays from AM Herculis. *C. L. Bhat, R. K. Kaul, H. S. Rawat, V. K. Senecha, R. C. Rannat, M. L. Sapru, A. K. Tickoo, & H. Razdan*. 369, 475, 43-E12 (1991)
- KAVANAGH, RALPH W. Signatures of Inhomogeneity in the Early Universe. *Lawrence H. Kawano, William A. Fowler, Ralph W. Kavanagh, & Robert A. Malaney*. 372, 1, 74-A11 (1991)
- Signatures of Inhomogeneity in the Early Universe: Erratum. *Lawrence H. Kawano, William A. Fowler, Ralph W. Kavanagh, & Robert A. Malaney*. 382, 358, 204-E13 (1991) (Orig. paper in 372, 1, 74-A11 (1991))
- KAWABE, RYOHEI. The Dense, Inner Part of the Protostellar Disk: Protostellar Candidates in GGD 27 IRS. *Takuya Yamashita, Yasuhiro Murata, Ryohei Kawabe, Norio Kaifu, & Motohide Tamura*. 373, 560, 95-A1 (1991)
- A Finger-like Extension of the 20 Kilometer per Second Cloud toward the Galactic Center. *Sachiko K. Okumura, Masato Ishiguro, Edward B. Fomalont, Tetsuo Hasegawa, Takashi Kasuga, Koh-Ichiro Morita, Ryohei Kawabe, & Hideyuki Kobayashi*. 378, 127, 152-E9 (1991)
- Aperture Synthesis CS(2-1) Observations of a Young Stellar Object GL 490: Accretion Flow in Gas Disk. *Akiko Nakamura, Ryoei Kawabe, Yoshimi Kitamura, Masato Ishiguro, Yasuhiro Murata, & Nagayoshi Ohashi*. 383, L81, 226-F5 (1991)
- KAWAI, N. Multifrequency Observations of BL Lacertae in 1988. *N. Kawai, M. Matsuoaka, J. N. Bregman, H. D. Aller, M. F. Aller, P. A. Hughes, S. A. Balbus, T. J. Balonek, K. C. Chambers, R. E. S. Clegg, S. D. Clements, R. J. Leacock, A. G. Smith, R. Goodrich, J. S. Miller, M. Hereld, M. G. Hoare, V. A. Hughes, G. K. Miley, G. H. Moriarty-Schieven, K. Mathews, G. Neugebauer, T. Ohashi, P. F. Roche, H. A. Thronson, E. Valtaoja, H. Terasranta, J. R. Webb, B. J. Wills, & D. Wills*. 382, 508, 207-G8 (1991)
- X-Ray and Radio Pulse Phase Comparison for PSR 1509-58. *N. Kawai, R. Okuyasu, W. Brinkmann, R. Manchester, A. G. Lyne, & N. D'Amico*. 383, L65, 226-D12 (1991)
- KAWAI, NOBUYUKI. Decrease in the Orbital Period of Hercules X-1. *John E. Deeter, Paul E. Boynton, Sigenori Miyamoto, Shunji Kitamoto, Fumiaki Nagase, & Nobuyuki Kawai*. 383, 324, 216-C1 (1991)
- KAWAKAMI, S. See ADARKAR, H., et al. Search for High-Energy Neutrinos from Celestial Sources in the Kolar Gold Fields Experiment.
- KAWALER, S. D. Adiabatic Properties of Pulsating DA White Dwarfs. I. The Treatment of the Brunt-Väisälä Frequency and the Region of Period Formation. *P. Brassard, G. Fontaine, F. Wesemael, S. D. Kawaler, & M. Tassoul*. 367, 601, 20-F11 (1991)
- See WINGET, D. E., et al. Astroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- Discovery and Seismological Interpretation of Low-Amplitude Modes in the Pulsating DO White Dwarf PG 1707+427 (V817 Herculis). *G. Fontaine, P. Bergeron, G. Vauchair, P. Brassard, F. Wesemael, S. D. Kawaler, A. D. Grauer, & D. E. Winget*. 378, L49, 162-F1 (1991)
- KAWANO, LAWRENCE H. Signatures of Inhomogeneity in the Early Universe. *Lawrence H. Kawano, William A. Fowler, Ralph W. Kavanagh, & Robert A. Malaney*. 372, 1, 74-A11 (1991)
- Signatures of Inhomogeneity in the Early Universe: Erratum. *Lawrence H. Kawano, William A. Fowler, Ralph W. Kavanagh, & Robert A. Malaney*. 382, 358, 204-E13 (1991) (Orig. paper in 372, 1, 74-A11 (1991))

- KAWARA, KIMIAKI. Near-Infrared Long-Slit Spectroscopy of IRAS 14348-1447. *Tadashi Nakajima, Kimiaki Kawara, Minoru Nishida, & Brooke Gregory.* 373, 452, 93-E6 (1991)
- KAZANAS, D. C IV Line Profile Correlations in NGC 4151. *R. P. Fahey, A. G. Michalitsianos, & D. Kazanas.* 371, 136, 61-F9 (1991)
- KAZANAS, DEMOSTHENES. General Structure of the Gravitational Equations of Motion in Conformal Weyl Gravity. *Demosthenes Kazanas & Philip D. Mannheim.* 76, 431, 31-B1 (1991)
- KEADY, JOHN J. CN and HCN in the Infrared Spectrum of IRC +10216. *G. R. Wiedemann, Kenneth H. Hinkle, John J. Keady, D. Denning, & D. E. Jennings.* 382, 321, 204-B10 (1991)
- KEEGSTRA, P. See SMOOT, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- KEEL, WILLIAM C. Dynamical Segregation of Direct and Retrograde Orbits in Binary Disk Galaxies. *William C. Keel.* 375, L5, 117-A13 (1991)
- Fe II Emission and Anisotropy in Broad-Line Regions. *Wei Zheng & William C. Keel.* 382, 121, 201-F5 (1991)
- The Ultraviolet Spectra of Nearby Radio Galaxies. *William C. Keel & Rogier A. Windhorst.* 383, 135, 213-F3 (1991)
- KEEAN, F. P. Relative Populations for Levels in the 3d<sup>2</sup> Ground Configuration of Fe VII. *F. P. Keenan & P. H. Norrington.* 368, 486, 31-B7 (1991)
- Fe XII Line Ratios in Solar Flares. *S. S. Tayal, Ronald J. W. Henry, F. P. Keenan, S. M. McCann, & K. G. Widing.* 369, 567, 44-G1 (1991)
- Ne V in Planetary Nebulae. *F. P. Keenan, V. M. Burke, & K. M. Aggarwal.* 371, 636, 69-D13 (1991)
- Fe XIV Line Ratios in the Sun. *F. P. Keenan, P. L. Dufton, M. B. Boylan, A. E. Kingston, & K. G. Widing.* 373, 695, 96-E13 (1991)
- IUE Observations of Early-Type Stars at High Galactic Latitudes. *D. A. Quin, P. J. F. Brown, E. S. Conlon, P. L. Dufton, & F. P. Keenan.* 375, 342, 115-B7 (1991)
- The 3s<sup>2</sup>3p<sup>2</sup>P-3s3p<sup>2</sup>4P Intercombination Lines of Fe XIV in the Sun. *F. P. Keenan, P. L. Dufton, E. S. Conlon, M. B. Boylan, A. E. Kingston, & K. G. Widing.* 379, 406, 168-A11 (1991)
- Effective Collision Strengths among Fine-Structure Levels of Ca XV: Erratum. *K. M. Aggarwal, K. A. Berrington, & F. P. Keenan.* 77, 441, 50-F1 (1991)
- Improved Line Ratio Calculations Involving Δn = 1 (2-3) Transitions in O V and a Reanalysis of Skylab Observations of Solar Flares. *F. P. Keenan, P. L. Dufton, L. K. Harra, E. S. Conlon, K. A. Berrington, A. E. Kingston, & K. G. Widing.* 382, 349, 204-E1 (1991)
- KEENE, JOCELYN. Millimeter Continuum Observations of Galactic Center Giant Molecular Cloud Cores. *D. C. Lis, J. E. Carlstrom, & Jocelyn Keene.* 380, 429, 183-E7 (1991)
- KELLER, C. U. Multicolor Continuum Analysis of the Solar Granulation in Quiet and Active Regions. *C. U. Keller & S. Koutchmy.* 379, 751, 174-B1 (1991)
- KELLEY, R. L. Detection of Coherent 7.6 Hz Oscillations during a Burst from Aquila X-1. *R. J. Schoelkopf & R. L. Kelley.* 375, 696, 121-D1 (1991)
- KELSALL, T. See HOLTZMAN, JON A., et al. Stellar Photometry with the *Hubble Space Telescope* Wide-Field/Planetary Camera: A Progress Report.
- See LAUER, TOD R., et al. The Core of the Nearby S0 Galaxy NGC 7457 Imaged with the *HST* Planetary Camera.
- See LAUER, TOD R., et al. The Postcollapse Core of M15 Imaged with the *HST* Planetary Camera.
- See HESTER, J. JEFF, et al. Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0''.1.
- See SMOOT, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a 7° Beam by the *Cosmic Background Explorer* (COBE).
- KENDZIORRA, E. Low-Flux Hard X-Ray Observation of Cygnus X-1. *P. Ubertini, A. Bazzano, C. La Padula, R. K. Manchanda, V. F. Polcaro, R. Staubert, E. Kendziorra, & F. Perotti.* 383, 263, 215-D9 (1991)
- KENNEY, JEFFREY D. P. The Star-forming Disk and CO Bar in M101. *Jeffrey D. P. Kenney, Nick Z. Scoville, & Christine D. Wilson.* 366, 432, 8-C1 (1991)
- Orbit Crowding of Molecular Gas at a Bar-Spiral Arm Transition Zone in M83. *Jeffrey D. P. Kenney & Steven D. Lord.* 381, 118, 190-D13 (1991)
- A Molecular Gas Ridge Offset from the Dust Lane in a Spiral Arm of M83. *Steven D. Lord & Jeffrey D. P. Kenney.* 381, 130, 190-E13 (1991)
- KENNICUTT, ROBERT. A Study of Star Formation in the Disks of Sa Galaxies. *Nelson Caldwell, Robert Kennicutt, Andrew C. Phillips, & Robert A. Schommer.* 370, 526, 54-G12 (1991)
- KENNICUTT, ROBERT C., JR. High Chemical Abundances in Virgo Spiral Galaxies? *Gregory A. Shields, Evan D. Skillman, & Robert C. Kennicutt, Jr.* 371, 82, 61-B1 (1991)
- He II Emission in Extragalactic H II Regions. *Donald R. Garnett, Robert C. Kennicutt, Jr., You-Hua Chu, & Evan D. Skillman.* 373, 458, 93-E14 (1991)
- H II Regions in Seven Dwarf Irregular Galaxies. *Nicolas V. Strobel, Paul Hodge, & Robert C. Kennicutt, Jr.* 383, 148, 213-G3 (1991)
- KENNY, H. T. AG Pegasi: A Multishell Radio Source. *H. T. Kenny, A. R. Taylor, & E. R. Seaquist.* 366, 549, 9-G7 (1991)
- KENT, S. M. Galactic Structure from the Spacelab Infrared Telescope. II. Luminosity Models of the Milky Way. *S. M. Kent, T. M. Dame, & G. Fazio.* 378, 131, 152-F1 (1991)
- KENT, STEPHEN M. Extragalactic Globular Clusters. II. The M31 Globular Cluster System. *John P. Huchra, Jean P. Brodie, & Stephen M. Kent.* 370, 495, 54-E5 (1991)
- KENYON, SCOTT J. See SAIZAR, PEDRO, et al. PW Vulpeculae: A Nova with Nearly Solar Abundances.
- Optical Excess Emission in T Tauri Stars. *Patrick Hartigan, Scott J. Kenyon, Lee Hartmann, Stephen E. Strom, Suzan Edwards, Alan D. Welty, & John Stauffer.* 382, 617, 209-C1 (1991)
- The Dusty Envelopes of FU Orionis Variables. *Scott J. Kenyon & Lee W. Hartmann.* 383, 664, 222-E1 (1991)
- On the Near-Infrared Spectrum of FU Orionis. *Nuria Calvet, Lee Hartmann, & Scott J. Kenyon.* 383, 752, 223-E6 (1991)
- KEPLER, S. O. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope. *S. O. Kepler, D. E. Winget, R. E. Nather, P. A. Bradley, A. D. Grauer, G. Fontaine, P. Bergeron, G. Vauclair, C. F. Claver, T. M. K. Marar, S. Seetha, B. N. Ashoka, T. Maze, E. Leibowitz, N. Dolez, M. Chevreton, M. A. Barstow, J. C. Clemens, S. J. Kleinman, A. E. Sansom, R. W. Tweedy, A. Kanaan, B. P. Hine, J. L. Provencal, F. Wesemael, M. A. Wood, P. Brassard, J.-E. Solheim, & P.-I. Emanuelsen.* 378, L45, 162-E7 (1991)
- KEPPEL, JEAN W. Extraplanar Ionized Gas and Kinematics in the Edge-on Galaxy NGC 891. *Jean W. Keppel, Ralf-Jürgen Dettmar, John S. Gallagher III, & Morton S. Roberts.* 374, 507, 105-D6 (1991)
- KETO, E. R. The Spectral Signatures of Collapse and Outflow around Young Stars. *E. R. Keto.* 371, 163, 62-B3 (1991)
- KETO, ERIC. High Angular Resolution Broad-Band Imaging in the Mid-Infrared: The Infrared-bright Galaxy NGC 34. *Eric Keto, Garrett Jernigan, Roger Ball, John Arens, & Margaret Meixner.* 374, L29, 110-B1 (1991)
- KETO, ERIC R. Gravitational Fragmentation: A Comparison with W49A. *Eric R. Keto, John C. Lattanzio, & Joe J. Monaghan.* 383, 639, 222-B12 (1991)
- KHALIULLIN, KH. F. On the Nature of the Anomalously Slow Apsidal Motion of DI Herculis. *Kh. F. Khalilullin, S. A. Khodykin, & A. I. Zakharov.* 375, 314, 114-G1 (1991)
- KHAVENSON, N. See BARRET, D., et al. Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2.
- See BOUCHET, L., et al. SIGMA Discovery of Variable e<sup>+</sup>-e<sup>-</sup> Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7-2942.
- See SUNYAEV, R., et al. Three Spectral States of 1E 1740.7-2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature.

- KHODYKIN, S. A.** On the Nature of the Anomalously Slow Apsidal Motion of DI Herculis. *Kh. F. Khalilullin, S. A. Khodykin, & A. I. Zakharov*. 375, 314, 114-G1 (1991)
- KICHENASSAMY, S.** The Relativistic Rotation Transformation and the Corotating Source Model. *S. Kichenassamy & R. A. Krikorian*. 371, 277, 63-E7 (1991)
- KIDDER, K. M.** The Isolated Massive DA White Dwarf GD 50. *P. Bergeron, K. M. Kidder, J. B. Holberg, James Liebert, F. Wesemael, & Rex A. Saffer*. 372, 267, 77-C5 (1991)
- KIDGER, M.** SN 1988A in M58: Departure from  $^{56}\text{Co}$  Decay 700 Days after Explosion. *P. Ruiz-Lapuente, M. Kidger, G. Gómez, R. Canal, & R. López*. 378, L41, 162-E1 (1991)
- KIEDA, D. B.** See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- KII, T.** X-Ray Continuum and Evidence for an Iron Emission Line from the Quasar E1821+643. *T. Kii, O. R. Williams, T. Ohashi, H. Awaki, K. Hayashida, H. Inoue, H. Kondo, K. Koyama, F. Makino, K. Makishima, R. D. Saxon, G. C. Stewart, S. Takano, Y. Tanaka, & M. J. L. Turner*. 367, 455, 19-A11 (1991)
- KILE, J. N.** A Search for the 154 Day Periodicity in the Occurrence Rate of Solar Flares Using Ottawa 2.8 GHz Burst Data, 1955–1990. *J. N. Kile & E. W. Cliver*. 370, 442, 52-F13 (1991)
- KILLIAN, T. C.** Astronomical Detection of  $\text{H}_2\text{CCC}$ . *J. Cernicharo, C. A. Gottlieb, M. Guélin, T. C. Killian, G. Paubert, P. Thaddeus, & J. M. Vrilek*. 368, L39, 35-C7 (1991)
- Astronomical Detection of  $\text{H}_2\text{CCCC}$ . *J. Cernicharo, C. A. Gottlieb, M. Guélin, T. C. Killian, P. Thaddeus, & J. M. Vrilek*. 368, L43, 35-C11 (1991)
- KIM, K.-T.** Detection of Excess Rotation Measure Due to Intracluster Magnetic Fields in Clusters of Galaxies. *K.-T. Kim, Peter C. Tribble, & P. P. Kronberg*. 379, 80, 164-A5 (1991)
- KIM, S.-H.** The Collimation of a Time-dependent Stellar Wind. *S.-H. Kim & A. C. Raga*. 379, 689, 173-C4 (1991)
- KIM, Y.-C.** The Effect of the Mihalas, Hummer, and Däppen Equation of State and the Molecular Opacity on the Standard Solar Model. *Y.-C. Kim, P. Demarque, & D. B. Guenther*. 378, 407, 156-A10 (1991)
- KIMBLE, R. A.** See FELDMAN, P. D., et al. Observations of Comet Levy (1990c) with the Hopkins Ultraviolet Telescope.
- See MOOS, H. W., et al. Determination of Ionic Abundances in the Io Torus Using the Hopkins Ultraviolet Telescope.
- KIMBLE, RANDY A.** See BLAIR, WILLIAM P., et al. Discovery of a Fast Radiative Shock Wave in the Cygnus Loop Using the Hopkins Ultraviolet Telescope.
- See LONG, KNOX S., et al. Spectroscopy of Z Camelopardalis in Outburst with the Hopkins Ultraviolet Telescope.
- See FERGUSON, HENRY C., et al. Constraints on the Origin of the Ultraviolet Upturn in Elliptical Galaxies from Hopkins Ultraviolet Telescope Observations of NGC 1399.
- KIMURA, KAZUHIRO.** X-Ray Variability of GX 339–4 in Its Very High State. *Sigenori Miyamoto, Kazuhiro Kimura, Shunji Kitamoto, Tadayasu Dotani, & Ken Ebisawa*. 383, 784, 224-A3 (1991)
- KING, ANDREW R.** Spin Evolution and Magnetic Fields in Cataclysmic Variables. *Andrew R. King & Jean-Pierre Lasota*. 378, 674, 160-G1 (1991)
- KING, I. R.** See MACCHETTO, F., et al. First Results from the Faint Object Camera: Observations of PKS 0521–36.
- See CRANE, P., et al. First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305.
- See JAKOBSEN, P., et al. First Results from the Faint Object Camera: SN 1987A.
- See PARESC, F., et al. First Results from the Faint Object Camera: Imaging the Core of R Aquarii.
- See MACCHETTO, F., et al. HST Observations of 3C 66B: A Double-stranded Optical Jet.
- See ALBRECHT, R., et al. First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System.
- See WEIGELT, G., et al. First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.
- KINGSTON, A. E.** Fe XIV Line Ratios in the Sun. *F. P. Keenan, P. L. Dufson, M. B. Boylan, A. E. Kingston, & K. G. Widing*. 373, 695, 96-E13 (1991)
- The  $3s^23p^2P-3s3p^24P$  Intercombination Lines of Fe XIV in the Sun. *F. P. Keenan, P. L. Dufson, E. S. Conlon, M. B. Boylan, A. E. Kingston, & K. G. Widing*. 379, 406, 168-A11 (1991)
- Improved Line Ratio Calculations Involving  $\Delta n = 1$  (2–3) Transitions in O V and a Reanalysis of *Skylab* Observations of Solar Flares. *F. P. Keenan, P. L. Dufson, L. K. Harr, E. S. Conlon, K. A. Berrington, A. E. Kingston, & K. G. Widing*. 382, 349, 204-E1 (1991)
- KINMAN, T. D.** Metal Abundances of RR Lyrae Variables in Selected Galactic Star Fields. V. The Lick Astrographic Fields at Intermediate Galactic Latitudes. *Nicholas B. Suntzeff, T. D. Kinman, & Robert P. Kraft*. 367, 528, 19-G13 (1991)
- Two Double-Mode RR Lyrae Stars in the Field. *Christine M. Clement, T. D. Kinman, & Nicholas B. Suntzeff*. 372, 273, 77-C13 (1991)
- KINNEY, A. L.** An Ultraviolet Atlas of Quasar and Blazar Spectra. *A. L. Kinney, R. C. Bohlin, J. C. Blades, & D. G. York*. 75, 645, 10-C7 (1991)
- HST Imaging of the Inner 3 Arcseconds of NGC 1068 in the Light of [O III]  $\lambda\lambda$  5007. *J. N. Evans, H. C. Ford, A. L. Kinney, R. R. J. Antonucci, L. Armus, & S. Caganoff*. 369, L27, 45-C9 (1991)
- The Featureless Continuum and Hydrogen Lines of Seyfert 2 Galaxies. *A. L. Kinney, R. R. J. Antonucci, M. J. Ward, A. S. Wilson, & M. Whittle*. 377, 100, 139-C5 (1991)
- See CAGANOFF, S., et al. Faint Object Spectrograph Spectroscopy of Resolved Structure in the Nucleus of NGC 1068.
- KIPLINGER, A. L.** Interrelation of Soft and Hard X-Ray Emissions during Solar Flares. I. Observations. *R. M. Winglee, A. L. Kiplinger, D. M. Zarro, G. A. Dulc, & J. R. Lemen*. 375, 366, 115-D13 (1991)
- KIPLINGER, ALAN L. A Study of the Ultraviolet Evolution of U Geminorum between Outbursts. *Alan L. Kiplinger, Edward M. Sion, & Paula Szkody*. 366, 569, 10-B1 (1991)
- KIRKPATRICK, J. DAVY.** A Standard Stellar Spectral Sequence in the Red/Near-Infrared: Classes K5 to M9. *J. Davy Kirkpatrick, Todd J. Henry, & Donald W. McCarthy, Jr.* 77, 417, 50-C5 (1991)
- KIRSHNER, R. P.** See JAKOBSEN, P., et al. First Results from the Faint Object Camera: SN 1987A.
- Properties of the SN 1987A Circumstellar Ring and the Distance to the Large Magellanic Cloud. *N. Panagia, R. Gilmozzi, F. Macchetto, H.-M. Adorf, & R. P. Kirshner*. 380, L23, 181-D1 (1991)
- KIRSHNER, ROBERT P.** Premaximum Observations of the Type Ia SN 1990N. *Bruno Leibundgut, Robert P. Kirshner, Alexei V. Filippenko, Joseph C. Shields, Craig B. Foltz, Mark M. Phillips, & George Sonneborn*. 371, L23, 66-D1 (1991)
- Spectra of Two Very Old Supernovae: SN 1986J and SN 1980K. *Bruno Leibundgut, Robert P. Kirshner, Philip A. Pinto, Michael P. Rupen, R. Chris Smith, James E. Gunn, & Donald P. Schneider*. 372, 531, 82-D1 (1991)
- Six Balmer-dominated Supernova Remnants. *R. Chris Smith, Robert P. Kirshner, William P. Blair, & P. Frank Winkler*. 375, 652, 120-G1 (1991)
- KIS-HALAS, K.** The LkH $\alpha$  101 Infrared Cluster. *M. Barsony, J. M. Schombert, & K. Kis-Halas*. 379, 221, 165-G1 (1991)
- KITAMOTO, S.** See NAGASE, F., et al. Cyclotron Line Features in the Spectrum of the Transient X-Ray Pulsar X0115+634.
- See COWLEY, A. P., et al. Discovery of a Long-Term Periodic Variation in LMC X-3.
- KITAMOTO, SHUNJI.** A Jet Model for a Very High State of GX 339–4. *Sigenori Miyamoto & Shunji Kitamoto*. 374, 741, 108-C6 (1991)
- Decrease in the Orbital Period of Hercules X-1. *John E. Deeter, Paul E. Boynton, Sigenori Miyamoto, Shunji Kitamoto, Fumiaki Nagase, & Nobuyuki Kawai*. 383, 324, 216-C1 (1991)
- X-Ray Variability of GX 339–4 in Its Very High State. *Sigenori Miyamoto, Kazuhiro Kimura, Shunji Kitamoto, Tadayasu Dotani, & Ken Ebisawa*. 383, 784, 224-A3 (1991)
- KITAMURA, T.** See MURAKI, Y., et al. Observations of Ultra-High-Energy Photons from Cygnus X-3.
- KITAMURA, YOSHIMI.** Aperture Synthesis CS(2-1) Observations of a Young Stellar Object GL 490: Accretion Flow in Gas Disk. *Akiko Nakamura, Ryohei Kawabe, Yoshimi Kitamura, Masato Ishiguro, Yasuhiro Murata, & Nagayoshi Ohashi*. 383, L81, 226-F5 (1991)

- KITAZAWA, H. Measurement of the Neutron Capture Rate of the  $^{12}\text{C}(n,\gamma)^{13}\text{C}$  Reaction at Stellar Energy. *Y. Nagai, M. Igashira, K. Takeda, N. Mukai, S. Motoyama, F. Uesawa, H. Kitazawa, & T. Fukuda.* 372, 683, 84-B7 (1991)
- See NAGAI, Y., et al. Capture Rate of the  $^7\text{Li}(n, \gamma)^8\text{Li}$  Reaction by Prompt Gamma-Ray Detection.
- KJELDSETH-MOE, O. An Ultraviolet Spectral Atlas of a Sunspot and an Active Region 1190-1730 Å. *P. Brekke, O. Kjeldseth-Moe, J.-D. P. Bartoe, & G. E. Brueckner.* 75, 1337, 23-C1 (1991)
- KLECKER, B. See ADAMS, J. H., JR., et al. The Charge State of the Anomalous Component of Cosmic Rays.
- KLEIN, KARL-LUDWIG. Direct VLBI Detection of the Magnetosphere Surrounding the Young Star S1 in  $\rho$  Ophiuchi. *Philippe André, Robert B. Phillips, Jean-François Lestrade, & Karl-Ludwig Klein.* 376, 630, 134-B12 (1991)
- KLEIN, RICHARD I. Accretion Powered Pulsars: Continuum Spectra and Light Curves of Settling Accretion Mounds. *David J. Burnard, Jonathan Arons, & Richard I. Klein.* 367, 575, 20-D10 (1991)
- Isothermal, Compton-heated Coronae above Accretion Disks. *Eve C. Ostriker, Christopher F. McKee, & Richard I. Klein.* 377, 593, 147-B3 (1991)
- KLEINMAN, S. J. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- KLEINMANN, S. G. Near-Infrared Long-Slit Spectra of NGC 1068. *M. Tamura, S. G. Kleinmann, N. Z. Scoville, & R. R. Joyce.* 371, 131, 61-F3 (1991)
- KLEMOLA, A. R. Optical and Radio Observations of the Binary Pulsar 1855+09: Evolution of Pulsar Magnetic Fields and Low-Mass White Dwarf Cooling. *S. R. Kulkarni, S. Djorgovski, & A. R. Klemola.* 367, 221, 14-G4 (1991)
- KLIMCHUK, J. A. A Model for the Formation of Solar Prominences. *S. K. Antiochos & J. A. Klimchuk.* 378, 372, 155-E6 (1991)
- KLUŻNIAK, WŁODZIMIERZ. Hard X-Ray Spectra from Gap Accretion onto Neutron Stars. *Włodzimierz Klużniak & James R. Wilson.* 372, L87, 85-E1 (1991)
- KLYPIN, A. A. Fluctuations of the Microwave Background Radiation on Large and Intermediate Angular Scales. *F. Atrio-Barandela, A. G. Doroshkevich, & A. A. Klypin.* 378, 1, 151-A11 (1991)
- KNACKE, R. F. Water Vapor in the Orion Molecular Cloud. *R. F. Knacke & H. P. Larson.* 367, 162, 14-A10 (1991)
- Detection of Silicates in the  $\beta$  Pictoris Disk. *C. M. Telesco & R. F. Knacke.* 372, L29, 79-D7 (1991)
- KNAPP, G. R. Molecular Gas in Elliptical Galaxies. *Joanna F. Lees, G. R. Knapp, Michael P. Rupen, & T. G. Phillips.* 379, 177, 165-B11 (1991)
- KNÖLKER, M. Scattering of Acoustic Waves from a Magnetic Flux Tube Embedded in a Radiating Fluid. *T. J. Bogdan & M. Knöller.* 369, 219, 38-F1 (1991)
- KO, S. See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- KO, YUAN-KUEN. The Effects of X-Ray Illumination on Accretion Disk Interiors. *Yuan-Kuen Ko & Timothy R. Kallman.* 374, 721, 108-A10 (1991)
- KOBAYAKAWA, K. See MURAKI, Y., et al. Observations of Ultra-High-Energy Photons from Cygnus X-3.
- KOBAYASHI, HIDEYUKI. A Finger-like Extension of the 20 Kilometer per Second Cloud toward the Galactic Center. *Sachiko K. Okumura, Masato Ishiguro, Edward B. Fomalont, Tetsuo Hasegawa, Takashi Kasuga, Koh-Ichiro Morita, Ryoei Kawabe, & Hideyuki Kobayashi.* 378, 127, 152-E9 (1991)
- KOBAYASHI, YUKIYASU. See SHIBAI, HIROSHI, et al. Large-Scale [C II] 158 Micron Emission from the Galaxy.
- KOCHANEK, CHRISTOPHER S. Magnetic Focusing of Precessing Jets. *Christopher S. Kochanek.* 371, 289, 63-F7 (1991)
- The Implications of Lenses for Galaxy Structure. *Christopher S. Kochanek.* 373, 354, 92-D7 (1991)
- Formation and Distortion of Optical Rings around Rich Cluster Galaxies. *Christopher S. Kochanek & Roger D. Blandford.* 375, 492, 118-G11 (1991)
- Selection Effects in Optical Surveys for Gravitational Lenses. *Christopher S. Kochanek.* 379, 517, 171-B1 (1991)
- Systematic Effects in Lens Inversions:  $N_1$  Exact Models for 0957+561. *Christopher S. Kochanek.* 382, 58, 200-G1 (1991)
- KODAIRA, KEIICHI. Vacuum Ultraviolet Imagery of the Virgo Cluster Region. III. Diffuse Far-Ultraviolet Radiation at High Galactic Latitudes. *Takashi Onaka & Keiichi Kodaira.* 379, 532, 171-CS (1991)
- KÖNIGL, ARIEH. Disk Accretion onto Magnetic T Tauri Stars. *Arieh Königl.* 370, L39, 53-E13 (1991)
- Scattering-induced Optical Polarization in Thick Accretion Disks. *John F. Karije & Arieh Königl.* 375, 69, 111-G6 (1991)
- Molecular Line Emission Models of Herbig-Haro Objects. I. H<sub>2</sub> Emission. *Mark G. Wolfe & Arieh Königl.* 383, 205, 214-E9 (1991)
- KOENIGSBERGER, GLORIA. Ultraviolet Variability of the Massive W-R Binary System HDE 311884 = WR 47. *Gloria Koenigsberger, Anthony F. J. Moffat, & Lawrence H. Auer.* 376, 272, 128-C9 (1991)
- KOGUT, A. See SMOOTH, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- KOGUT, AL. The Temperature of the Cosmic Microwave Background Radiation at 3.8 GHz: Results of a Measurement from the South Pole Site. *Giovanni De Amici, Marco Bersanelli, Al Kogut, Steve Levin, Michele Limon, & George F. Smoot.* 381, 341, 193-C1 (1991)
- KOJIMA, H. See MURAKI, Y., et al. Observations of Ultra-High-Energy Photons from Cygnus X-3.
- KOLLATSCHEK, W. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- KOLMAN, MICHAEL. The Ultraviolet Spectrum and Continuum Energy Distribution of the Bright Quasar H1821+643. *Michiel Kolman, Jules P. Halpern, Chris R. Shrader, & Alexei V. Filippenko.* 373, 57, 86-F8 (1991)
- KOŁODZIEJCZAK, J. See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- KONDO, H. See KII, T., et al. X-Ray Continuum and Evidence for an Iron Emission Line from the Quasar E1821+643.
- KONDO, Y. The Circumstellar Disks of  $\beta$  Pictoris Analogs. *C. A. Grady, Frederick C. Bruhweiler, K. P. Cheng, W. A. Chiu, & Y. Kondo.* 367, 296, 15-F9 (1991)
- A Cool Supergiant with Anomalous Behavior of the 2800 Mg II Doublet. *G. A. Gurzadyan, Y. Kondo, S. S. Rustambekyan, Yervant Terzian, & Mario R. Perez.* 378, 298, 154-F1 (1991)
- KONDO, YOJI. Conditions for Accretion-induced Collapse of White Dwarfs. *Ken'ichi Nomoto & Yoji Kondo.* 367, L19, 17-D1 (1991)
- Mass Outflow in the Nearby Proto-Planetary System  $\beta$  Pictoris. *Frederick C. Bruhweiler, Yoji Kondo, & C. A. Grady.* 371, L27, 66-D7 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Resolved Velocity and Density Structure in the  $\beta$  Pictoris Circumstellar Gas. *A. Boggess, Frederick C. Bruhweiler, C. A. Grady, Dennis C. Ebbets, Yoji Kondo, L. M. Trafton, John C. Brandt, & S. R. Heap.* 377, L49, 143-F1 (1991)
- JUE Investigation of Mass Flow in the Interacting Binary U Sagittae. *George E. McCluskey, Jr., Carolina Pacienza Salas McCluskey, & Yoji Kondo.* 378, 281, 154-D9 (1991)
- KONDRATEVA, M. A. See ADAMS, J. H., JR., et al. The Charge State of the Anomalous Component of Cosmic Rays.
- KONTIZAS, E. Observations of the Peculiar Object MWC 560 in Outburst. *A. G. Michalitsianos, S. P. Maran, R. J. Oliversen, B. Bopp, E. Kontizas, A. Dapergolas, & M. Kontizas.* 371, 761, 71-A7 (1991)
- KONTIZAS, M. Observations of the Peculiar Object MWC 560 in Outburst. *A. G. Michalitsianos, S. P. Maran, R. J. Oliversen, B. Bopp, E. Kontizas, A. Dapergolas, & M. Kontizas.* 371, 761, 71-A7 (1991)
- KOO, BON-CHUL. A Survey of H I 21 Centimeter Emission Lines toward Supernova Remnants. *Bon-Chul Koo & Carl Heiles.* 382, 204, 202-F11 (1991)
- KOO, DAVID C. See WINDHORST, ROGIER A., et al. The Discovery of a Young Radio Galaxy at  $z = 2.390$ : Probing Initial Star Formation at  $z \lesssim 3.0$ .

- KOOMEN, M. J. Solar Gamma-Ray-Line Flares, Type II Radio Bursts, and Coronal Mass Ejections. *E. W. Cliver, H. V. Cane, D. J. Forrest, M. J. Koomen, R. A. Howard, & C. S. Wright.* 379, 741, 174-A2 (1991)
- KOONIN, S. E. Pycnonuclear Fusion Rates: Erratum. *S. Schramm & S. E. Koonin.* 377, 343, 142-B12 (1991) (Orig. paper in 365, 296, 210-B1 (1990))
- KOPER, E. A Complete CO Survey of M31. *E. Koper, T. M. Dame, F. P. Israel, & P. Thaddeus.* 383, L11, 219-B7 (1991)
- KOPP, G. A. Submillimeter Solar Limb Profiles Determined from Observations of the Total Solar Eclipse of 1988 March 18. *T. L. Roellig, E. E. Becklin, J. T. Jeffe, G. A. Kopp, C. A. Lindsey, F. Q. Orrall, & M. W. Werner.* 381, 288, 192-E5 (1991)
- KORATKAR, A. P. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- KORATKAR, ANURADHA P. Structure and Kinematics of the Broad-Line Regions in Active Galaxies from IUE Variability Data. *Anuradha P. Koratkar & C. Martin Gaskell.* 75, 719, 11-B5 (1991)
- The Shape of the Ultraviolet Continuum of Quasars and Intergalactic Dust. *F. H. Cheng, C. Martin Gaskell, & Anuradha P. Koratkar.* 370, 487, 54-D9 (1991)
- Radius-Luminosity and Mass-Luminosity Relationships for Active Galactic Nuclei. *Anuradha P. Koratkar & C. Martin Gaskell.* 370, L61, 59-B1 (1991)
- IUE Observations of NGC 5548, 1978-1988: The Sizes and Kinematics of the Broad-Line Region. *Anuradha P. Koratkar & C. Martin Gaskell.* 375, 85, 112-A13 (1991)
- KORISTA, K. T. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- KOROLKOVA, I. V. See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- KORTCHAGUIN, P. V. See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- KORTH, A. Sulfur-bearing Ions in the Ionosphere of Comet Halley. *M. L. Marconi, D. A. Mendis, D. L. Mitchell, R. P. Lin, A. Korth, & H. Reme.* 378, 756, 161-F7 (1991)
- KORYCANSKY, D. G. Two-dimensional Hydrodynamic Calculations of the Nonlinear Development of the Goldreich-Schubert-Fricke Instability in a Rotating Annulus. *D. G. Korycansky.* 381, 515, 197-B1 (1991)
- KORZENNIK, S. G. What We Know about the Sun's Internal Rotation from Solar Oscillations. *Philip R. Goode, W. A. Dziembowski, S. G. Korzennik, & E. J. Rhodes, Jr.* 367, 649, 21-C11 (1991)
- KOUPELIS, THEODOROS. Atmospheric Gradients and the Stability of Expanding Jets. *Philip E. Hardee, Michael L. Norman, Theodoros Koupelis, & David A. Clarke.* 373, 8, 86-B10 (1991)
- KOUTCHMY, S. Multicolor Continuum Analysis of the Solar Granulation in Quiet and Active Regions. *C. U. Keller & S. Koutchmy.* 379, 751, 174-B1 (1991)
- KOVACS, GÉZA. Periodic Stellar Pulsations: Stability Analysis and Amplitude Equations. *J. Robert Buchler, Paweł Moskalik, & Géza Kovács.* 380, 185, 178-D1 (1991)
- KOVNER, ISRAEL. Bounds on the Enhancement of Quasar Counts by Lenses. *Israel Kovner.* 376, 70, 125-G8 (1991)
- Bounds on Intergalactic Compact Objects from Observations of Compact Radio Sources. *Aggeliki Kassiola, Israel Kovner, & Roger D. Blandford.* 381, 6, 189-B4 (1991)
- KOYAMA, K. See KII, T., et al. X-Ray Continuum and Evidence for an Iron Emission Line from the Quasar E1821+643. Discovery of 111 Second Pulsation from the X-Ray Source Scutum X-1. *K. Koyama, H. Kunieda, Y. Takeuchi, & Y. Tawara.* 370, L77, 59-D1 (1991)
- An X-Ray Pulsator in the Direction of Molecular Cloud MBM 12 (Lynds 1457). *K. Koyama, S. Takano, Y. Tawara, T. Matsumoto, K. Noguchi, Y. Fukui, T. Iwata, N. Ohashi, K. Tatematsu, N. Takahashi, T. Umemoto, K. W. Hodapp, J. Rayner, & K. Makishima.* 377, 240, 141-A1 (1991)
- Discovery of a Cyclotron Resonance Feature at 30 keV from the Transient X-Ray Pulsar Cepheus X-4. *T. Mihara, K. Makishima, S. Kamijo, T. Ohashi, F. Nagase, Y. Tanaka, & K. Koyama.* 379, L61, 175-C6 (1991)
- KOYAMA, KATSUJI. Discovery of Periodic Eclipses in the X-Ray Pulsar 1H 0253+193. *Yuichi Kamata, Yuzuru Tawara, & Katsuji Koyama.* 379, L65, 175-C13 (1991)
- KOZOLOVSKY, B. Solar Abundances from Gamma-Ray Spectroscopy: Comparisons with Energetic Particle, Photospheric, and Coronal Abundances. *R. J. Murphy, R. Ramaty, B. Kozlovsky, & D. V. Reames.* 371, 793, 71-D6 (1991)
- KRABBE, A. High-Resolution Imaging of Brackett- $\gamma$  and H<sub>2</sub> 1-0 S(1) Emission in the Seyfert Galaxy NGC 1068. *V. Rotaciuc, A. Krabbe, M. Cameron, S. Drapatz, R. Genzel, A. Sternberg, & J. W. V. Storey.* 370, L23, 53-D6 (1991)
- A Cluster of He I Emission-Line Stars in the Galactic Center. *A. Krabbe, R. Genzel, S. Drapatz, & V. Rotaciuc.* 382, L19, 205-C1 (1991)
- KRAFT, RALPH P. Determination of Confidence Limits for Experiments with Low Numbers of Counts. *Ralph P. Kraft, David N. Burrows, & John A. Nousek.* 374, 344, 102-D1 (1991)
- KRAFT, ROBERT P. Metal Abundances of RR Lyrae Variables in Selected Galactic Star Fields. V. The Lick Astrographic Fields at Intermediate Galactic Latitudes. *Nicholas B. Suntzeff, T. D. Kinman, & Robert P. Kraft.* 367, 528, 19-G13 (1991)
- KRAKAUER, D. A. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- KRAUSS, LAWRENCE M. A New Approach to Gravitational Microlensing: Time Delays and the Galactic Mass Distribution. *Lawrence M. Krauss & Todd A. Small.* 378, 22, 151-C8 (1991)
- KRAUTTER, J. The High State of the FU Orionis Variable Z Canis Majoris. *F. V. Hessman, J. Eisloffel, R. Mundt, L. W. Hartmann, W. Herbst, & J. Krautter.* 370, 384, 52-A10 (1991)
- KREIDL, T. J. N. See FRANZ, O. G., et al. Binary Star Observations with the *Hubble Space Telescope* Fine Guidance Sensors. I. ADS 11300.
- KREIDL, TOBIAS J. Narrow-Band Photometry and the Evolution of Galaxies. III. The Intermediate-Redshift Sample. *Karl D. Rakos, James M. Schombert, & Tobias J. Kreidl.* 377, 382, 144-E7 (1991)
- Optical Identification of the X-Ray Source GS 2023+338 as V404 Cygni. *R. Mark Wagner, Sumner G. Starfield, Steve B. Howell, Tobias J. Kreidl, S. J. Bus, A. Cassatella, R. Bertram, & R. Fried.* 378, 293, 154-E10 (1991)
- KRICHBAUM, T. P. See QUIRRENBACH, A., et al. Correlated Radio and Optical Variability in the BL Lacertae Object 0716+714.
- KRIKORIAN, R. A. The Relativistic Rotation Transformation and the Corotating Source Model. *S. Kichenassamy & R. A. Krikorian.* 371, 277, 63-E7 (1991)
- KRIMIGIS, S. M. Statistical Properties of Shock-accelerated Ions in the Outer Heliosphere. *L. J. Lanzerotti, R. E. Gold, D. J. Thomson, R. E. Decker, C. G. Maclennan, & S. M. Krimigis.* 380, L93, 188-F10 (1991)
- KRISCIUNAS, K. Mapping of Infrared Helium and Hydrogen Line Profiles in the Central Few Arcseconds of the Galaxy. *T. R. Geballe, K. Krisciunas, J. A. Bailey, & R. Wade.* 370, L73, 59-C8 (1991)
- KRISHER, T. P. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of Voyager 2. *T. P. Krisher, J. D. Anderson, D. D. Morabito, S. W. Asmar, S. E. Borutzki, M. L. Delitsky, A. C. Densmore, P. M. Esse, G. D. Lewis, M. J. Maurer, D. C. Roth, Y. H. Son, T. R. Spilker, D. N. Sweetnam, A. H. Taylor, G. L. Tyler, D. L. Gresh, & P. A. Rosen.* 375, L57, 124-C6 (1991)
- KRISHER, TIMOTHY P. Voyager 2 Test of the Radar Time-Delay Effect. *Timothy P. Krisher, John D. Anderson, & Anthony H. Taylor.* 373, 665, 96-C1 (1991)
- KRISHNA SWAMY, K. S. Synthetic Profile Analysis of the Observed (0,0) Swan Band of Comet Halley. *K. S. Krishna Swamy.* 373, 266, 89-C7 (1991)
- KRISHNASWAMY, M. R. See ADARKAR, H., et al. Search for High-Energy Neutrinos from Celestial Sources in the Kolar Gold Fields Experiment.
- KRISS, G. A. Ultraviolet Variability of NGC 5548: Dynamics of the Continuum Production Region and Geometry of the Broad-Line

- Region. *J. H. Krlik, Keith Horne, T. R. Kallman, M. A. Malkan, R. A. Edelson, & G. A. Kriss.* 371, 541, 68-C6 (1991)
- See CAGANOFF, S., et al. Faint Object Spectrograph Spectroscopy of Resolved Structure in the Nucleus of NGC 1068.
- Faint Object Spectrograph Observations of the Low-Luminosity Seyfert Galaxy NGC 1566. *G. A. Kriss, G. F. Hartig, L. Armus, William P. Blair, S. Caganoff, & L. Dressel.* 377, L13, 143-C1 (1991)
- See FELDMAN, P. D., et al. Observations of Comet Levy (1990c) with the Hopkins Ultraviolet Telescope.
- See MOOS, H. W., et al. Determination of Ionic Abundances in the Io Torus Using the Hopkins Ultraviolet Telescope.
- KRISS, GERARD A. See BLAIR, WILLIAM P., et al. Discovery of a Fast Radiative Shock Wave in the Cygnus Loop Using the Hopkins Ultraviolet Telescope.
- See LONG, KNOX S., et al. Spectroscopy of Z Camelopardalis in Outburst with the Hopkins Ultraviolet Telescope.
- See FERGUSON, HENRY C., et al. Constraints on the Origin of the Ultraviolet Upturn in Elliptical Galaxies from Hopkins Ultraviolet Telescope Observations of NGC 1399.
- KRISTIAN, JEROME. See LAUER, TOD R., et al. The Core of the Nearby S0 Galaxy NGC 7457 Imaged with the *HST* Planetary Camera.
- KRISTIAN, JEROME A. See LYNDS, ROGER, et al. NGC 1068: Resolution of Nuclear Structure in the Optical Continuum.
- KRIVORUCHENKO, M. I. Astrophysical Limits for Binding Energy of Strange Matter. *M. I. Krivoruchenko & B. V. Martemyanov.* 378, 628, 160-C1 (1991)
- KROEKER, T. L. The Accuracy of Galaxy Masses from the Timing Argument. *T. L. Kroeker & R. G. Carlberg.* 376, 1, 125-B1 (1991)
- KROLIK, J. H. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- Ultraviolet Variability of NGC 5548: Dynamics of the Continuum Production Region and Geometry of the Broad-Line Region. *J. H. Krlik, Keith Horne, T. R. Kallman, M. A. Malkan, R. A. Edelson, & G. A. Kriss.* 371, 541, 68-C6 (1991)
- KROLIK, JULIAN H. Relativistic Motion in Gamma-Ray Bursts. *Julian H. Krlik & Edward A. Pier.* 373, 277, 89-D8 (1991)
- Multipolar Magnetic Fields in Neutron Stars. *Julian H. Krlik.* 373, L69, 97-E4 (1991)
- KRONBERG, P. P. Faraday Rotation and Physical Conditions in the Crab Nebula. *M. F. Bietenholz & P. P. Kronberg.* 368, 231, 26-A1 (1991)
- The Expansion of the Crab Nebula. *M. F. Bietenholz, P. P. Kronberg, D. E. Hogg, & A. S. Wilson.* 373, L59, 97-D5 (1991)
- Detection of Excess Rotation Measure Due to Intracluster Magnetic Fields in Clusters of Galaxies. *K.-T. Kim, Peter C. Tribble, & P. P. Kronberg.* 379, 80, 164-A5 (1991)
- KRONBERG, PHILIP P. H II Regions in M82: High-Resolution Millimeter Continuum Observations. *J. E. Carlstrom & Philipp P. Kronberg.* 366, 422, 8-B1 (1991)
- A Technique for Using Radio Jets as Extended Gravitational Lensing Probes. *Philipp P. Kronberg, Charles C. Dyer, E. Margaret Burbidge, & Vesa T. Junkkarinen.* 367, L1, 17-B1 (1991)
- KRUJ, J. W. See FELDMAN, P. D., et al. Observations of Comet Levy (1990c) with the Hopkins Ultraviolet Telescope.
- See MOOS, H. W., et al. Determination of Ionic Abundances in the Io Torus Using the Hopkins Ultraviolet Telescope.
- KRUJ, JEFFREY W. See BLAIR, WILLIAM P., et al. Discovery of a Fast Radiative Shock Wave in the Cygnus Loop Using the Hopkins Ultraviolet Telescope.
- See LONG, KNOX S., et al. Spectroscopy of Z Camelopardalis in Outburst with the Hopkins Ultraviolet Telescope.
- See FERGUSON, HENRY C., et al. Constraints on the Origin of the Ultraviolet Upturn in Elliptical Galaxies from Hopkins Ultraviolet Telescope Observations of NGC 1399.
- KUBONO, S. See NAGAI, Y., et al. Capture Rate of the  $^7\text{Li}(n, \gamma)^8\text{Li}$  Reaction by Prompt Gamma-Ray Detection.
- KUDRITZKI, R. P. See HEAP, S. R., et al. First Results from the Goddard High-Resolution Spectrograph: Spectroscopic Determination of Stellar Parameters of Melnick 42, an O3f Star in the Large Magellanic Cloud.
- KUDRYAVTSEV, V. A. See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- KÜHR, H. The Complete Sample of 1 Jansky BL Lacertae Objects. I. Summary Properties. *M. Stickel, P. Padovani, C. M. Urry, J. W. Fried, & H. Kühr.* 374, 431, 104-E1 (1991)
- KUHN, J. R. Short-Term Changes in Solar Oscillation Frequencies and Solar Activity. *M. F. Woodard, J. R. Kuhn, N. Murray, & K. G. Libbrecht.* 373, L81, 97-F12 (1991)
- Nonfacular Solar Luminosity Variations. *J. R. Kuhn & K. G. Libbrecht.* 381, L35, 194-E1 (1991)
- KUHN, JEFFREY R. Diffuse Light in Dense Clusters of Galaxies. I. R-Band Observations of Abell 2029. *Juan M. Uson, Stephen P. Boughn, & Jeffrey R. Kuhn.* 369, 46, 36-E7 (1991)
- KUIJKEN, KONRAD. The Galactic Disk Surface Mass Density and the Galactic Force  $K_g$  at  $z = 1.1$  Kiloparsecs. *Konrad Kuijken & Gerard Gilmore.* 367, L9, 17-C1 (1991)
- Further Limits on Disklike Dark Matter from K Dwarf Kinematics. *Konrad Kuijken.* 372, 125, 75-E7 (1991)
- Galactic Disk Warps. *Konrad Kuijken.* 376, 467, 132-C4 (1991)
- KUIN, N. P. M. Opacity Effects on the Radiative Losses of Coronal Loops. *N. P. M. Kuin & A. I. Poland.* 370, 763, 57-G11 (1991)
- KUIPER, T. B. H. See WANNIER, P. G., et al. Water in Dense Molecular Clouds.
- KULKARNI, S. R. Optical and Radio Observations of the Binary Pulsar 1855+09: Evolution of Pulsar Magnetic Fields and Low-Mass White Dwarf Cooling. *S. R. Kulkarni, S. Djorgovski, & A. R. Clemola.* 367, 221, 14-G4 (1991)
- Timing Observations of the 8 Hour Binary Pulsars 2127+11C in the Globular Cluster M15. *T. A. Prince, S. B. Anderson, S. R. Kulkarni, & A. Wolszczan.* 374, L41, 110-C1 (1991)
- KULKARNI, SHRINIVAS R. On the Detectability of Pulsars in Close Binary Systems. *Helen M. Johnston & Shrinivas R. Kulkarni.* 368, 504, 31-D1 (1991)
- Deep VLA Images of Globular Clusters. *Helen M. Johnston, Shrinivas R. Kulkarni, & W. M. Goss.* 382, L89, 211-D11 (1991)
- KUMAR, P. Reconstructing the Primordial Spectrum of Fluctuations of the Universe from the Observed Nonlinear Clustering of Galaxies. *A. J. S. Hamilton, P. Kumar, Edward Lu, & Alex Matthews.* 374, L1, 103-B7 (1991)
- KUMAR, PAWAN. Implications of Solar  $p$ -Mode Frequency Shifts. *Peter Goldreich, Norman Murray, Gregory Willette, & Pawan Kumar.* 370, 752, 57-F12 (1991)
- Thermal and Mechanical Damping of Solar  $p$ -Modes. *Peter Goldreich & Pawan Kumar.* 374, 366, 102-F1 (1991)
- The Location of the Source of High-Frequency Solar Acoustic Oscillations. *Pawan Kumar & Edward Lu.* 375, L35, 117-D12 (1991)
- KUNDU, M. R. See NITTA, N., et al. Coronal Magnetic Structures Observing Campaign. I. Simultaneous Microwave and Soft X-Ray Observations of Active Regions at the Solar Limb.
- Large-Scale Features of the Sun at 20 Centimeter Wavelength. *N. Gopalswamy, S. M. White, & M. R. Kundu.* 379, 366, 167-E9 (1991)
- KUNIEDA, H. Discovery of 111 Second Pulsation from the X-Ray Source Scutum X-1. *K. Koyama, H. Kunieda, Y. Takeuchi, & Y. Tawara.* 370, L77, 59-D1 (1991)
- KUNKEL, WILLIAM E. Using SN 1987A Light Echoes to Determine Mass Loss from the Progenitor. *Arlin P. S. Croots & William E. Kunkel.* 366, L73, 11-D1 (1991)
- KUNO, NARIO. U-shaped Outflow in the Lynds 1221 Dark Cloud: An Example of Interaction of Outflows with Ambient Molecular Clouds. *Tomofumi Umemoto, Naomi Hirano, Osamu Kameya, Yasuo Fukui, Nario Kuno, & Keiya Takakubo.* 377, 510, 146-A13 (1991)
- KUROKAWA, SHIN. The Shock Process and Light-Element Production in Supernova Envelopes. *Lawrence E. Brown, David S. Dearborn, David N. Schramm, Jon T. Larsen, & Shin Kurokawa.* 371, 648, 69-F1 (1991)
- KURTZ, D. W. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.

- KURTZ, JOE. Theoretical Vibrations of Carbon Chains C<sub>3</sub>, C<sub>4</sub>, C<sub>5</sub>, C<sub>6</sub>, C<sub>7</sub>, C<sub>8</sub>, and C<sub>9</sub>. *Joe Kurtz & Ludwik Adamowicz*. 370, 784, 58-C5 (1991)
- KUSUNOSE, MASAAKI. Two-Temperature Accretion Disks with Winds in a Fluid Approximation. *Masaaki Kusunose*. 370, 505, 54-F1 (1991)
- Pair-Density Transitions in Accretion Disk Coronae. *Masaaki Kusunose & Shin Mineshige*. 381, 490, 196-G1 (1991)
- KUTNER, MARC L. CS Multitransitional Studies of Density Distribution in Star-forming Regions. I. The NGC 2071 Region. *Shudong Zhou, Neal J. Evans II, Rolf Güsten, Lee G. Mundy, & Marc L. Kutner*. 372, 518, 82-C1 (1991)
- KUWASHIMA, FUMIYOSHI. The Rosseland Mean Free-Free Gaunt Factor of the Dense High-Temperature Stellar Plasma. *Naoki Itoh, Fumiyoishi Kuwashima, Koki Ichihashi, & Haruhiko Mutoh*. 382, 636, 209-E1 (1991)
- KUZNETZOV, A. See BARRET, D., et al. Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2.
- KWITTER, KAREN B. The Multiple-Shell Structure of the Planetary Nebula NGC 6751. *You-Hua Chu, Arturo Manchado, George H. Jacoby, & Karen B. Kwitter*. 376, 150, 126-F13 (1991)
- KWOK, P. W. See MACOMB, D. J., et al. Search for TeV Emission from 4U 0115+63.
- See VACANTI, G., et al. Gamma-Ray Observations of the Crab Nebula at TeV Energies.
- A Model of Unpulsed Very High Energy Gamma Rays from the Crab Nebula and Pulsar. *P. W. Kwok, K. S. Cheng, & M. M. Lau*. 379, 653, 172-G1 (1991)
- See REYNOLDS, P. T., et al. Search for TeV Gamma-Ray Emission from Hercules X-1.
- See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- KWOK, S. On the Possible Bipolar Nature of 21 Micron IRAS Sources. *Bruce J. Hrivnak & S. Kwok*. 368, 564, 32-B1 (1991)
- KWOK, S. F. Numerical Study of a Perturbed Einstein-de Sitter Cosmological Model. *H. V. Fagundes & S. F. Kwok*. 368, 337, 29-C4 (1991)
- KWOK, SUN. Energy Distributions of Symbiotic Novae. *Greg L. Bryan & Sun Kwok*. 368, 252, 26-C1 (1991)
- The Carbon-rich Proto-Planetary Nebula IRAS 22272+5435. *Bruce J. Hrivnak & Sun Kwok*. 371, 631, 69-D6 (1991)
- High-Resolution Radio Continuum Observations of Compact Planetary Nebulae. *O. B. Aaquist & Sun Kwok*. 378, 599, 159-G1 (1991)
- New Low-Resolution Spectrometer Spectra for IRAS Sources. *Kevin Volk, Sun Kwok, R. E. Stencel, & E. Brugel*. 77, 607, 53-A1 (1991)
- New Candidates for Carbon Stars with Silicate Features. *S. Josephine Chan & Sun Kwok*. 383, 837, 224-F1 (1991)
- KYLAFIS, NIKOLAOS D. Collisional Pumping of H<sub>2</sub>O Masers in Star-forming Regions. *Nikolaos D. Kyllafis & Colin A. Norman*. 373, 525, 94-D13 (1991)
- KYLLING, A. Discrete Ordinate Solution of the Radiative Transfer Equation in the "Polarization Normal Wave Representation." *A. Kylling*. 383, 243, 215-C1 (1991)
- LABAY, JAVIER. The Outcome of Explosive Ignition of ONeMg Cores: Supernovae, Neutron Stars, or "Iron" White Dwarfs? *Jordi Isern, Ramon Canal, & Javier Labay*. 372, L83, 85-D9 (1991)
- LABONTE, B. J. Power Spectra of Solar Convection. *D.-Y. Chou, B. J. LaBonte, D. C. Braun, & T. L. Duvall, Jr.* 372, 314, 77-G5 (1991)
- LABONTE, BARRY J. Can the Starpatch on  $\xi$  Bootis A Be Explained by Using Tangential Flows? *Clifford G. Toner & Barry J. LaBonte*. 368, 633, 33-A10 (1991)
- LABOV, SIMON E. Spectral Observations of the Extreme Ultraviolet Background. *Simon E. Labov & Stuart Bowyer*. 371, 810, 71-F1 (1991)
- LACEY, CEDRIC. Tidally Triggered Galaxy Formation. I. Evolution of the Galaxy Luminosity Function. *Cedric Lacey & Joseph Silk*. 381, 14, 189-C1 (1991)
- LACHIEZE-REY, MARC. Scaling Invariance in the Galaxy Distribution. II. Spatial and Luminosity Effects. *Sophie Maurogordato & Marc Lachièze-Rey*. 369, 30, 36-D1 (1991)
- LACY, J. H. Discovery of Interstellar Methane: Observations of Gaseous and Solid CH<sub>4</sub> Absorption toward Young Stars in Molecular Clouds. *J. H. Lacy, J. S. Carr, Neal J. Evans II, F. Baas, J. M. Achtermann, & J. F. Arens*. 376, 556, 133-C9 (1991)
- A Gaseous Tail Ablated from the Supergiant IRS 7 near the Galactic Center. *E. Serabyn, J. H. Lacy, & J. M. Achtermann*. 378, 557, 159-C9 (1991)
- Galactic Center Gasdynamics: A One-armed Spiral in a Keplerian Disk. *J. H. Lacy, J. M. Achtermann, & E. Serabyn*. 380, L71, 188-D6 (1991)
- Infrared Molecular Spectroscopy toward the Orion IRc2 and IRc7 Sources: A New Probe of Physical Conditions and Abundances in Molecular Clouds. *Neal J. Evans II, J. H. Lacy, & John S. Carr*. 383, 674, 222-E13 (1991)
- LACY, JOHN H. Detection of Low-J Pure-Rotational Emission from H<sub>2</sub> in the Orion Bar Region: Evidence for Small-Scale Clumpiness. *Parvinder S. Parmar, John H. Lacy, & Jeffrey M. Achtermann*. 372, L25, 79-D1 (1991)
- LADA, CHARLES J. The Structure and Kinematics of Bipolar Outflows: Observations and Models of the Monoceros R2 Outflow. *Barry A. Meyers-Rice & Charles J. Lada*. 368, 445, 30-E10 (1991)
- Star Formation and the Nature of Bipolar Outflows. *Frank H. Shu, Steven P. Ruden, Charles J. Lada, & Susana Lizano*. 370, L31, 53-E1 (1991)
- Infrared Images of M17. *Charles J. Lada, D. L. DePoy, K. M. Merrill, & Ian Gailey*. 374, 533, 105-G1 (1991)
- LADA, ELIZABETH A. An Unbiased Survey for Dense Cores in the Lynds 1630 Molecular Cloud. *Elizabeth A. Lada, John Bally, & Antony A. Stark*. 368, 432, 30-D9 (1991)
- A 2.2 Micron Survey in the L1630 Molecular Cloud. *Elizabeth A. Lada, D. L. DePoy, Neal J. Evans II, & Ian Gailey*. 371, 171, 62-C1 (1991)
- LADD, E. F. Thermal and Nonthermal Motions in Dense Cores. *P. C. Myers, E. F. Ladd, & G. A. Fuller*. 372, L95, 85-E9 (1991)
- Far-Infrared and Submillimeter Wavelength Observations of Star-forming Dense Cores. II. Images. *E. F. Ladd, Fred C. Adams, S. Casey, J. A. Davidson, G. A. Fuller, D. A. Harper, P. C. Myers, & R. Padman*. 382, 555, 208-D7 (1991)
- LADEITER, H. P. The Cyclotron Maser Instability: Application to Low-Density Magnetoplasmas. *H. P. Ladreiter*. 370, 419, 52-D12 (1991)
- LAHAV, OFER. Peculiar Cluster Velocities from Measurements of the Kinematic Sunyaev-Zeldovich Effect. *Yoel Rephaeli & Ofer Lahav*. 372, 21, 74-C7 (1991)
- Evolution of Velocity and Density Fields around Clusters of Galaxies. *Per B. Lilje & Ofer Lahav*. 374, 29, 98-D3 (1991)
- Unsaturated Comptonization of Isotropic Photon Spectra by Relativistic Electrons. *Abraham Loeb, Christopher F. McKee, & Ofer Lahav*. 374, 44, 98-E5 (1991)
- Cross-Correlation of the X-Ray Background with Nearby Galaxies. *Keith Jahoda, Ofer Lahav, Richard F. Mushotzky, & Elihu Boldt*. 378, L37, 162-D7 (1991)
- LAI, DONG. Equation of State in Metals and Cold Stars: Evaluation of Statistical Models. *Dong Lai, Andrew M. Abrahams, & Stuart L. Shapiro*. 377, 612, 147-C10 (1991)
- Cold Equation of State in a Strong Magnetic Field: Effects of Inverse  $\beta$ -Decay. *Dong Lai & Stuart L. Shapiro*. 383, 745, 223-D11 (1991)
- LAIRD, D. C. See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- LAMB, R. C. Phase Coherence for TeV/PeV Binary Sources. *D. A. Lewis, R. C. Lamb, & S. D. Biller*. 369, 479, 43-F4 (1991)
- See MACOMB, D. J., et al. Search for TeV Emission from 4U 0115+63.
- See VACANTI, G., et al. Gamma-Ray Observations of the Crab Nebula at TeV Energies.
- See AKERLOF, C. W., et al. Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy.
- See REYNOLDS, P. T., et al. Search for TeV Gamma-Ray Emission from Hercules X-1.
- LAMBAS, DIEGO G. An Analysis of Abell and ACO Catalogs of Clusters of Galaxies. *Mariano A. Nicotra & Diego G. Lambas*. 382, 55, 200-F11 (1991)

- LAMBERT, DAVID L. First Results from the Goddard High-Resolution Spectrograph: C I, S I, and CO toward  $\zeta$  Persei and the Physical Conditions in Diffuse Clouds. *Andrew M. Smith, Frederick C. Bruhweiler, David L. Lambert, Blair D. Savage, Jason A. Cardelli, Dennis C. Ebbets, Cheng-Hsuan Lyu, & Yaron Sheffer.* 377, L61, 143-G1 (1991)
- Lithium Abundances in Carbon Stars. *Grant R. Dunn, R. Earle Luck, & David L. Lambert.* 377, 657, 147-G5 (1991)
- Interstellar  $^{12}\text{C}/^{13}\text{C}$  Ratio Revisited. *Philippe Crane, Dennis J. Hegyi, & David L. Lambert.* 378, 181, 153-C1 (1991)
- LAME, N. J. NGC 6302: Ionized by a Very Hot Star or by a Wind? *N. J. Lame & G. J. Ferland.* 367, 208, 14-F1 (1991)
- See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- LAMERS, H. J. G. L. M. Wolf-Rayet Stars as Starting Points or as Endpoints of the Evolution of Massive Stars? *H. J. G. L. M. Lamers, A. Maeder, W. Schmutz, & J. P. Cassinelli.* 368, 538, 31-F12 (1991)
- LAMERS, HENRY J. G. L. M. Si IV and C IV Resonance Lines as Indicators of Massive Stars in Starburst Galaxies. *Claus Leitherer & Henry J. G. L. M. Lamers.* 373, 89, 87-B6 (1991)
- LANDSMAN, WAYNE. Stellar Lyman-Alpha Emission and the Local Interstellar Medium. *Wayne Landsman & Theodore Simon.* 366, L79, 11-D9 (1991)
- The Onset of Chromospheric Activity among the A and F Stars. *Theodore Simon & Wayne Landsman.* 380, 200, 178-E3 (1991)
- LANDSMAN, WAYNE B. See BOHLIN, RALPH C., et al. Simulated Optical Images of Galaxies at  $z \sim 1$  Using Ultraviolet Images of Nearby Galaxies.
- LANG, KENNETH R. Multi-Wave Band SMM-VLA Observations of an M2 Flare and an Associated Coronal Mass Ejection. *Robert F. Willson, Joan T. Schmelz, Raymond D. Gonzalez, Kenneth R. Lang, & Kermit L. Smith.* 378, 360, 155-D6 (1991)
- LANG, M. J. See MACOMB, D. J., et al. Search for TeV Emission from 4U 0115+63.
- See VACANTI, G., et al. Gamma-Ray Observations of the Crab Nebula at TeV Energies.
- See AKERLOF, C. W., et al. Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy.
- See REYNOLDS, P. T., et al. Search for TeV Gamma-Ray Emission from Hercules X-1.
- LANGER, STEVEN H. Formulae for the Cyclotron Luminosity of Magnetized Plasma Slabs. *G. Channugam & Steven H. Langer.* 368, 580, 32-C11 (1991)
- LANGER, W. D. Anatomy of the Barnard 5 Core. *G. A. Fuller, P. C. Myers, W. J. Welch, P. F. Goldsmith, W. D. Langer, B. G. Campbell, S. Guilloteau, & R. W. Wilson.* 376, 135, 126-E10 (1991)
- LANGER, WILLIAM D. Infrared Dust and Millimeter-Wave Carbon Monoxide Emission in the Orion Region. *John Bally, William D. Langer, & Weihong Liu.* 383, 645, 222-C6 (1991)
- LANGHOFF, STEPHEN R. Theoretical Study of the Spectroscopy of FeH<sup>+</sup>. *Stephen R. Langhoff & Charles W. Bauschlicher, Jr.* 375, 843, 123-B1 (1991)
- LANGSTON, GLEN. The Fourth MIT-Green Bank 5 GHz Survey. *Mark Griffith, Glen Langston, Mike Heflin, Sam Conner, & Bernard Burke.* 75, 801, 12-C5 (1991)
- LANNING, HOWARD. See DUNCAN, DOUGLAS K., et al. Ca II H and K Measurements Made at Mount Wilson Observatory, 1966-1983.
- LANZEROTTI, L. J. Statistical Properties of Shock-accelerated Ions in the Outer Heliosphere. *L. J. Lanzerotti, R. E. Gold, D. J. Thomson, R. E. Decker, C. G. MacLennan, & S. M. Krimigis.* 380, L93, 188-F10 (1991)
- LANZETTA, K. M. High-Resolution Spectroscopy of Q1100-264 Again. *R. F. Carswell, K. M. Lanzetta, H. C. Parnell, & J. K. Webb.* 371, 36, 60-E1 (1991)
- LANZETTA, KENNETH M. Evolution of High-Redshift Lyman-Limit Absorption Systems. *Kenneth M. Lanzetta.* 375, 1, 111-A11 (1991)
- A New Spectroscopic Survey for Damped Ly $\alpha$  Absorption Lines from High-Redshift Galaxies. *Kenneth M. Lanzetta, Arthur M. Wolfe, David A. Turnshek, Limin Lu, Richard G. McMahon, & Cyril Hazard.* 77, 1, 43-B1 (1991)
- LAOR, A. See MAOZ, D., et al. High-Rate Active Galaxy Monitoring at the Wise Observatory. III. The Broad-Line Region of NGC 4151.
- See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- LAOR, ARI. Line Profiles from a Disk around a Rotating Black Hole. *Ari Laor.* 376, 90, 126-B1 (1991)
- LA PADULA, C. Low-Flux Hard X-Ray Observation of Cygnus X-1. *P. Ubertini, A. Bazzano, C. La Padula, R. K. Manchanda, V. F. Polcaro, R. Staubert, E. Kendziora, & F. Perotti.* 383, 263, 215-D9 (1991)
- LAPIDUS, I. I. On Spectra of X-Ray Bursters in the Expansion Phase. *I. I. Lapidus.* 377, L93, 150-E1 (1991)
- LARSEN, JON T. The Shock Process and Light-Element Production in Supernova Envelopes. *Lawrence E. Brown, David S. Dearborn, David N. Schramm, Jon T. Larsen, & Shin Kurokawa.* 371, 648, 69-F1 (1991)
- LARSON, H. P. Water Vapor in the Orion Molecular Cloud. *R. E. Knacke & H. P. Larson.* 367, 162, 14-A10 (1991)
- LASKER, BARRY M. The Young Supernova Remnants N132D and 1E 0102.2-7219: Limits on the Presence of Rapidly Moving Sulfur. *Barry M. Lasker & David A. Golimowski.* 371, 568, 68-E8 (1991)
- LASOTA, JEAN-PIERRE. Spin Evolution and Magnetic Fields in Cataclysmic Variables. *Andrew R. King & Jean-Pierre Lasota.* 378, 674, 160-G1 (1991)
- LATTANZIO, JOHN C. Stellar Evolutionary Models from the Zero-Age Main Sequence to the First Thermal Pulse. *John C. Lattanzio.* 76, 215, 27-B9 (1991)
- A Simulation of the Collapse and Fragmentation of Cooling Molecular Clouds. *Joe J. Monaghan & John C. Lattanzio.* 375, 177, 113-C1 (1991)
- Gravitational Fragmentation: A Comparison with W49A. *Eric R. Keto, John C. Lattanzio, & Joe J. Monaghan.* 383, 639, 222-B12 (1991)
- LATTER, WILLIAM B. Molecular Hydrogen Formation by Excited Atom Radiative Association. *William B. Latter & John H. Black.* 372, 161, 76-A4 (1991)
- Large Molecule Production by Mass-losing Carbon Stars: The Primary Source of Interstellar Polycyclic Aromatic Hydrocarbons? *William B. Latter.* 377, 187, 140-C5 (1991)
- LAU, M. M. Very High Energy Gamma-Ray Emission from Accreting X-Ray Pulsars. *K. S. Cheng, K. N. Yu, T. Cheung, & M. M. Lau.* 379, 290, 166-F1 (1991)
- A Model of Unpulsed Very High Energy Gamma Rays from the Crab Nebula and Pulsar. *P. W. Kwok, K. S. Cheng, & M. M. Lau.* 379, 653, 172-G1 (1991)
- LAU, YUN-TUNG. Three-dimensional Kinematic Reconnection of Plasmoids. *Yun-Tung Lau & John M. Finn.* 366, 577, 10-B11 (1991)
- LAUER, TOD R. See HOLTZMAN, JON A., et al. Stellar Photometry with the Hubble Space Telescope Wide-Field/Planetary Camera: A Progress Report.
- The Core of the Nearby S0 Galaxy NGC 7457 Imaged with the HST Planetary Camera. *Tod R. Lauer, S. M. Faber, Jon A. Holtzman, William A. Baum, Douglas G. Currie, S. P. Ewald, Edward J. Groth, J. Jeff Hester, T. Kelsall, Jerome Kristian, Robert M. Light, C. Roger Lynds, Earl J. O'Neil, Jr., Edward J. Shaya, & James A. Westphal.* 369, L41, 45-E9 (1991)
- The Postcollapse Core of M15 Imaged with the HST Planetary Camera. *Tod R. Lauer, Jon A. Holtzman, S. M. Faber, William A. Baum, Douglas G. Currie, S. P. Ewald, Edward J. Groth, J. Jeff Hester, T. Kelsall, Robert M. Light, C. Roger Lynds, Earl J. O'Neil, Jr., Donald P. Schneider, Edward J. Shaya, & James A. Westphal.* 369, L45, 45-F1 (1991)
- See WESTPHAL, JAMES A., et al. Hubble Space Telescope Wide-Field/Planetary Camera Images of Saturn.
- See HESTER, J. JEFF, et al. Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0''.1.
- LAUREIJS, R. J. Dust and Molecular Properties of the Low-Opacity Cloud Lynds 1563. *Frank O. Clark, R. J. Laureijs, & Lauri L. Wardell.* 370, 237, 50-B7 (1991)
- The Temperature of Large Dust Grains in Molecular Clouds. *F. O. Clark, R. J. Laureijs, & T. Prusti.* 371, 602, 69-A7 (1991)

- IRAS** Detection of Very Cold Dust in the Lynds 134 Cloud Complex.  
*R. J. Laureijs, F. O. Clark, & T. Prusti.* 372, 185, 76-C4 (1991)
- LAURENT, PH. See BARRET, D., et al. Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2.
- LAVELY, EUGENE M. A Unified Approach to the Helioseismic Forward and Inverse Problems of Differential Rotation.  
*Michael H. Ritzwoller & Eugene M. Lavelly.* 369, 557, 44-F5 (1991)
- LAWRENCE, A. See SOIFER, B. T., et al. Near-Infrared Observations of the  $z \approx 2.3$  IRAS Source FSC 10214+4724.
- LAWRENCE, C. R. Optical Polarization of a Complete Sample of Radio Sources.  
*C. D. Impey, C. R. Lawrence, & S. Tapia.* 375, 46, 111-E10 (1991)
- First- and Second-Epoch VLBI Observations of the Gravitational Lens System 2016+112.  
*M. B. Heflin, M. V. Gorenstein, C. R. Lawrence, & B. F. Burke.* 378, 519, 158-G9 (1991)
- LAWRENCE, J. K. Weak Magnetic Fields and Solar Irradiance Variations.  
*J. K. Lawrence, G. A. Chapman, & S. R. Walton.* 375, 771, 122-C1 (1991)
- LAWRENCE, L. C. See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- LAWRENCE, M. A. See AKERLOF, C. W., et al. Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy.
- LAZIO, T. JOSEPH. Interstellar Scattering Effects on the Detection of Narrow-Band Signals.  
*James M. Cordes & T. Joseph Lazio.* 376, 123, 126-D10 (1991)
- LEACH, ROBERT W. Polarimetric Mapping of Orion Using MILLIPOL: Magnetic Activity in BN/KL.  
*Robert W. Leach, Dan P. Clemens, Brian D. Kane, & Richard Barvainis.* 370, 257, 50-D1 (1991)
- LEACOCK, R. J. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- LEAHY, D. A. HEAO 1 A-2 Low-Energy Detector X-Ray Spectra of the Lupus Loop and SN 1006.  
*D. A. Leahy, J. Nousek, & A. J. S. Hamilton.* 374, 218, 100-G1 (1991)
- LEAHY, J. P. Multifrequency Radio Observations of Cygnus A: Spectral Aging in Powerful Radio Galaxies.  
*C. L. Carilli, R. A. Perley, J. W. Dreher, & J. P. Leahy.* 383, 554, 221-B9 (1991)
- LEAHY, J. PATRICK. Depolarization Asymmetry in the Quasar 3C 47. *Ilias Fornini, J. Patrick Leahy, Jack O. Burns, & John P. Basart.* 381, 63, 189-G1 (1991)
- LEBEDEV, M. G. The Influence of the Interface between the Heliosphere and the Local Interstellar Medium on the Penetration of the H Atoms to the Solar System. *V. B. Baranov, M. G. Lebedev, & Yu. G. Malama.* 375, 347, 115-C1 (1991)
- LE BORGNE, JEAN-FRANÇOIS. A Straight Gravitational Image in Abell 2390: A Striking Case of Lensing by Cluster of Galaxies.  
*Roser Pello, Jean-François Le Borgne, Geneviève Soucail, Yannick Mellier, & Blai Sanahuja.* 366, 405, 7-G9 (1991)
- LEBRUN, F. See BARRET, D., et al. Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2.
- See BOUCHET, L., et al. SIGMA Discovery of Variable  $e^+e^-$  Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7-2942.
- See SUNYAEV, R., et al. Three Spectral States of 1E 1740.7-2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature.
- LECAUXHE, A. See WANNIER, P. G., et al. Water in Dense Molecular Clouds.
- LECKRONE, DAVID S. First Results from the Goddard High-Resolution Spectrograph: High-Resolution Observations of the 1942 Å Resonance Line of Hg II in the Chemically Peculiar B Star,  $\chi$  Lupi.  
*David S. Leckrone, Glenn M. Wahlgren, & Sveneric G. Johansson.* 377, L37, 143-E1 (1991)
- First Results from the Goddard High-Resolution Spectrograph: A Demonstration of Spectral Resolution and Experiments with Deconvolution.  
*Glenn M. Wahlgren, David S. Leckrone, Steven N. Shore, Don J. Lindler, Ronald L. Gilliland, & Dennis C. Ebbets.* 377, L41, 143-E6 (1991)
- LEE, C.-W. X-Ray Halos as Diagnostics of Interstellar Grains.  
*John S. Mathis & C.-W. Lee.* 376, 490, 132-E1 (1991)
- LEE, HYUNG MOK. Multicomponent Models for the Dynamic Evolution of Globular Clusters.  
*Hyung Mok Lee, Gregory G. Fahman, & Harvey B. Richer.* 366, 455, 8-E1 (1991)
- LEE, L. C. 3.3 Micron Emission from Ultraviolet Excitation of Some Aromatic Molecules.  
*Jun Shan, Masako Suto, & L. C. Lee.* 383, 459, 218-A7 (1991)
- LEE, MARTIN A. On the Transport and Acceleration of Solar Flare Particles in a Coronal Loop.  
*James M. Ryan & Martin A. Lee.* 368, 316, 26-A7 (1991)
- LEE, Y. C. Statistical-Mechanical Selection of the Shapes of Disk Galaxies.  
*David Montgomery & Y. C. Lee.* 368, 380, 29-G1 (1991)
- LEE, YOUNGUNG. Star Counts and Carbon Monoxide Observations of Maddalena's Cloud.  
*Youngung Lee, Ronald L. Snell, & Robert L. Dickman.* 379, 639, 172-E11 (1991)
- LEE, YOUNG-WOOK. Stellar Evolution and Period Changes in RR Lyrae Stars.  
*Young-Wook Lee.* 367, 524, 19-G7 (1991)
- The Globular Cluster  $\omega$  Centauri: The Origin of the Mysterious Correlation between the RR Lyrae Luminosity and [Fe/H].  
*Young-Wook Lee.* 373, L43, 97-B7 (1991)
- LEES, JOANNA F. Molecular Gas in Elliptical Galaxies.  
*Joanna F. Lees, G. R. Knapp, Michael P. Rupen, & T. G. Phillips.* 379, 177, 165-B11 (1991)
- LE FÈVRE, O. Multicolor CCD Imaging of Supergiants in the Disk of NGC 253.  
*T. J. Davidge, O. Le Fèvre, & C. C. Clark.* 370, 559, 55-D7 (1991)
- Deep Spectroscopy under High Spatial Resolution of the High-Redshift Radio Source 3CR 368: The Monster Elucidated.  
*F. Hammer, O. Le Fèvre, & D. Proust.* 374, 91, 99-B7 (1991)
- LEHNERT, M. D. Abundances in the Red Giants of M13 and M22.  
*M. D. Lehner, R. A. Bell, & J. G. Cohen.* 367, 514, 19-F9 (1991)
- LEHNERT, MATTHEW D. Spatially Resolved Optical Images of High-Redshift Quasi-stellar Objects.  
*Timothy M. Heckman, Matthew D. Lehner, Wil van Breugel, & George K. Miley.* 370, 78, 48-A7 (1991)
- Spectroscopy of Spatially Extended Material around High-Redshift Radio-loud Quasars.  
*Timothy M. Heckman, Matthew D. Lehner, George K. Miley, & Wil van Breugel.* 381, 373, 195-D1 (1991)
- LEIBOWITZ, E. See MAOZ, D., et al. High-Rate Active Galaxy Monitoring at the Wise Observatory. III. The Broad-Line Region of NGC 4151.
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- LEIBUNDGUT, BRUNO. Premaximum Observations of the Type Ia SN 1990N.  
*Bruno Leibundgut, Robert P. Kirshner, Alexei V. Filippenko, Joseph C. Shields, Craig B. Foltz, Mark M. Phillips, & George Sonneborn.* 371, L23, 66-D1 (1991)
- Spectra of Two Very Old Supernovae: SN 1986J and SN 1980K.  
*Bruno Leibundgut, Robert P. Kirshner, Philip A. Pinto, Michael P. Rupen, R. Chris Smith, James E. Gunn, & Donald P. Schneider.* 372, 531, 82-D1 (1991)
- LEISAWITZ, D. A 21 Centimeter Line Survey of a Region around Four Outer Galaxy Open Clusters.  
*D. Leisawitz & E. J. de Geus.* 75, 835, 13-A1 (1991)
- A Model for the Infrared Emission from an OB Star Cluster Environment.  
*D. Leisawitz.* 77, 451, 51-B1 (1991)
- LEISING, MARK D. A Search for the 478 keV Line from the Decay of Nucleosynthetic  $^{7}\text{Be}$ .  
*Michael J. Harris, Mark D. Leising, & Gerald H. Share.* 375, 216, 113-F5 (1991)
- LEITHERER, CLAUS. Non-LTE Analysis of the Ospe/WN9 Star HDE 269227 (R84).  
*Werner Schmutz, Claus Leitherer, Ivan Hubeny, Manfred Vogel, Wolf-Rainer Hamann, & Ulf Wesselohmann.* 372, 664, 84-A1 (1991)
- Si IV and C IV Resonance Lines as Indicators of Massive Stars in Starburst Galaxies.  
*Claus Leitherer & Henny J. G. L. M. Lamers.* 373, 89, 87-B6 (1991)
- Observations of Stellar Winds from Hot Stars at 1.3 Millimeters.  
*Claus Leitherer & Carmelle Robert.* 377, 629, 147-E1 (1991)
- LEKA, K. D. The Diffuse Interstellar Bands. VIII. New Features between 6000 and 8650 Å.  
*G. H. Herbig & K. D. Leka.* 382, 193, 202-E12 (1991)
- LELLOUCH, EMMANUEL. First Absolute Wind Measurements in the Middle Atmosphere of Mars.  
*Emmanuel Lellouch, Jeffrey J.*

- Goldstein, Stephen W. Bouger, Gabriel Paubert, & Jan Rosengqvist.** 383, 401, 217-C5 (1991)
- LEHEN, J. R.** Interrelation of Soft and Hard X-Ray Emissions during Solar Flares. I. Observations. *R. M. Winglee, A. L. Kiplinger, D. M. Zarro, G. A. Dulc, & J. R. Lemen.* 375, 366, 115-D13 (1991)
- LEMONS, JOSE P. S.** Global Stability of Self-similar Newtonian Gaseous Disks against Axisymmetric Perturbations. *José P. S. Lemons, Agnis J. Kalnajs, & Donald Lynden-Bell.* 375, 484, 118-G1 (1991)
- LENZINI, PAOLO.** Rosseland and Planck Mean Opacities of a Zero-Metallicity Gas. *Paolo Lenzini, David F. Chernoff, & Edwin E. Salpeter.* 76, 759, 35-B13 (1991)
- LEOJS, JAMES A.** A Rich Cluster of Radio Stars in the  $\rho$  Ophiuchi Cloud Cores. *James A. Leous, Eric D. Feigelson, Philippe André, & Thierry Montmerle.* 379, 683, 173-B10 (1991)
- LEPP, S.** Interstellar Photodissociation and Photoionization Rates. *W. G. Roberge, D. Jones, S. Lepp, & A. Dalgarno.* 77, 287, 48-B1 (1991)
- LEPPIK, P.** Relativistic Electron Populations in Cassiopeia A. *M. Anderson, L. Rudnick, P. Lepik, R. Perley, & R. Braun.* 373, 146, 87-G4 (1991)
- LESAGE, A.** Regularities of Stark Parameters along the Periodic Table. *J. Puric, M. Čuk, M. S. Dimitrijević, & A. Lesage.* 382, 353, 204-E7 (1991)
- LESSI, O.** 3C 345: Is the Variability of Quasars Nonlinear? *R. Vio, S. Cristiani, O. Lessi, & L. Salvadori.* 380, 351, 182-F1 (1991)
- LESTER, D. F.** The Far-Infrared Morphology of the Double-ringed Galaxy NGC 4736 (M94): A Ring Surrounding an Extended Nucleus. *Beverly J. Smith, D. F. Lester, P. M. Harvey, & R. W. Pogge.* 373, 66, 86-G5 (1991)
- The Far-Infrared Morphology of the Double-ringed Spiral Galaxy NGC 4736 (M94): A Ring Surrounding an Extended Nucleus: Erratum. *Beverly J. Smith, D. F. Lester, P. M. Harvey, & R. W. Pogge.* 380, 677, 186-E6 (1991) (Orig. paper in 373, 66, 86-G5 (1991))
- LESTER, DANIEL F.** Dust Properties around Evolved Stars from Far-Infrared Size Limits. *Paul M. Harvey, Daniel F. Lester, David Strock, & Marshall Joy.* 368, 558, 32-A8 (1991)
- Testing Models of Low-Mass Star Formation: High-Resolution Far-Infrared Observations of L1551 IRS 5. *Harold M. Butner, Neal J. Evans II, Daniel F. Lester, Russell M. Levreault, & Stephen E. Strom.* 376, 636, 134-C6 (1991)
- LESTRADE, JEAN-FRANÇOIS.** Direct VLBI Detection of the Magnetosphere Surrounding the Young Star S1 in  $\rho$  Ophiuchi. *Philippe André, Robert B. Phillips, Jean-François Lestrade, & Karl-Ludwig Klein.* 376, 630, 134-B12 (1991)
- LEUNG, CHUN MING.** Size and Density Distribution of Very Small Dust Grains in the Barnard 5 Cloud. *Dariusz C. Lis & Chun Ming Leung.* 372, L107, 85-F9 (1991)
- Radiation Transport in Dust in Disk Geometry. I. Application to Externally Heated Interstellar Clouds. *George F. Spagna, Jr., Chun Ming Leung, & Michael P. Egan.* 379, 232, 166-A5 (1991)
- On the Nature of the Excess 100 Micron Flux Associated with Carbon Stars. *Michael P. Egan & Chun Ming Leung.* 383, 314, 216-B1 (1991)
- LEVATO, HUGO.** Spectroscopic Binaries in the Open Cluster Trumpler 16. *Hugo Levato, Stella Malaroda, Nidia Morrell, Beatriz García, & Carlos Hernández.* 75, 869, 13-C13 (1991)
- Spectroscopic Binaries in the Orion OB1 Association. *Nidia Morrell & Hugo Levato.* 75, 965, 15-F5 (1991)
- LEVENTHAL, M.** Search for H<sub>2</sub>-He Alloy Formation at Low Pressures and Cosmic Snowballs. *M. Leventhal & A. P. Mills, Jr.* 368, 178, 25-C7 (1991)
- GRIS Observations of <sup>26</sup>Al Gamma-Ray Line Emission from Two Points in the Galactic Plane. *B. J. Teegarden, S. D. Barthelmy, N. Gehrels, J. Tueller, M. Leventhal, & C. J. MacCallum.* 375, L9, 117-B4 (1991)
- GRIS Observations of Positron Annihilation Radiation from the Galactic Center. *N. Gehrels, S. D. Barthelmy, B. J. Teegarden, J. Tueller, M. Leventhal, & C. J. MacCallum.* 375, L13, 117-B10 (1991)
- LEVIN, STEVE.** The Temperature of the Cosmic Microwave Background Radiation at 3.8 GHz: Results of a Measurement from the South Pole Site. *Giovanni De Amici, Marco Bersanelli, Al Kogut, Steve Levin, Michele Limon, & George F. Smoot.* 381, 341, 193-C1 (1991)
- LEVINE, A.** LMC X-4: Ginga Observations and Search for Orbital Period Changes. *A. Levine, S. Rappaport, A. Putney, R. Corbet, & F. Nagase.* 381, 101, 190-C7 (1991)
- LEVINSON, AMIR.** Can Neutron Stars Ablate Their Companions? *Amir Levinson & David Eichler.* 379, 359, 167-E1 (1991)
- LEVISON, HAROLD F.** Optical Colors of Early-Type Galaxies in Compact Groups. *Stephen E. Zeff, Bradley C. Whitmore, & Harold F. Levison.* 383, 524, 220-G1 (1991)
- LEVREAU, RUSSELL M.** Testing Models of Low-Mass Star Formation: High-Resolution Far-Infrared Observations of L1551 IRS 5. *Harold M. Butner, Neal J. Evans II, Daniel F. Lester, Russell M. Levreault, & Stephen E. Strom.* 376, 636, 134-C6 (1991)
- LEVY, E. H.** Dynamo Magnetic Field Modes in Thin Astrophysical Disks: An Adiabatic Computational Approximation. *T. F. Stepinski & E. H. Levy.* 379, 343, 167-C9 (1991)
- LEWIN, W. H. G.** See TAN, J., et al. Changes in the 11 Minute Period of 4U 1820-30.
- Observations of Scorpius X-1 with JUE: Ultraviolet Results from a Multiwavelength Campaign. *S. D. Vrilek, W. Penninx, J. C. Raymond, F. Verbunt, P. Hertz, K. Wood, W. H. G. Lewin, & K. Mitsuda.* 376, 278, 128-D1 (1991)
- See WOOD, K. S., et al. Searches for Millisecond Pulsations in Low-Mass X-Ray Binaries.
- LEWIS, D. A.** Phase Coherence for TeV/PeV Binary Sources. *D. A. Lewis, R. C. Lamb, & S. D. Biller.* 369, 479, 43-F4 (1991)
- See MACOMB, D. J., et al. Search for TeV Emission from 4U 0115+63.
- See VACANTI, G., et al. Gamma-Ray Observations of the Crab Nebula at TeV Energies.
- See AKERLOF, C. W., et al. Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy.
- See REYNOLDS, P. T., et al. Search for TeV Gamma-Ray Emission from Hercules X-1.
- LEWIS, G. D.** See KRISHER, T. P., et al. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of Voyager 2.
- LEWIS, R.** See UBERTINI, P., et al. "Superlow-State" Hard X-Ray Observation of Cygnus X-1.
- See BAZZANO, A., et al. Hard X-Rays from Coma Cluster Region: Erratum.
- LEWIS, R. A.** See PEROTTI, F., et al. Hard X-Ray Variability of NGC 4151.
- LEWIS, ROY S.** Interstellar Grains within Interstellar Grains. *Thomas J. Bernatowicz, Sachiko Amari, Ernst K. Zinner, & Roy S. Lewis.* 373, L73, 97-E10 (1991)
- <sup>26</sup>Al and <sup>16</sup>O in the Early Solar System: Clues from Meteoritic Al<sub>2</sub>O<sub>3</sub>. *Edward Anders, Alois Virág, Ernst Zinner, & Roy S. Lewis.* 373, L77, 97-F6 (1991)
- <sup>3</sup>-Process Ba, Nd, and Sm in Presolar SiC from the Murchison Meteorite. *Ernst Zinner, Sachiko Amari, & Roy S. Lewis.* 382, L47, 205-E11 (1991)
- L'HEUREUX, JACQUES.** Energy Spectra and Composition of Primary Cosmic Rays. *Dietrich Müller, Simon P. Swordy, Peter Meyer, Jacques L'Heureux, & John M. Grunsfeld.* 374, 356, 102-E1 (1991)
- LI, ZHI-YUN.** Asymptotic Structure of Hydromagnetically Driven Relativistic Winds. *Tzihong Chiueh, Zhi-yun Li, & Mitchell C. Begelman.* 377, 462, 145-D11 (1991)
- LI, ZONGWEI.** A Statistical Study of the Correlation of Galactic Supernova Remnants and Spiral Arms. *Zongwei Li, J. Craig Wheeler, Frank N. Bash, & W. H. Jefferys.* 378, 93, 152-B9 (1991)
- LIANG, E. P.** Luminosity Enhancement Factor for Thermal Comptonization and the Electron Energy Balance. *C. D. Dermer, E. P. Liang, & E. Canfield.* 369, 410, 42-G5 (1991)
- LIANG, EDISON P.** Structure of Thermal Pair Clouds around Gamma-Ray-emitting Black Holes. *Edison P. Liang.* 367, 470, 19-C1 (1991)
- Luminosity Limit for Alpha-Viscosity Accretion Disks. *Edison P. Liang & Amri Wandel.* 376, 746, 135-E8 (1991)
- Hybrid Accretion Disks in Active Galactic Nuclei. I. Structure and Spectra. *Amri Wandel & Edison P. Liang.* 380, 84, 177-B1 (1991)

- X-Ray Detectability of Gamma-Ray Bursts from M31.** *Edison P. Liang.* 380, L55, 188-B11 (1991)
- LIBBRECHT, K. G.** Short-Term Changes in Solar Oscillation Frequencies and Solar Activity. *M. F. Woodard, J. R. Kuhn, N. Murray, & K. G. Libbrecht.* 373, L81, 97-F12 (1991)
- Is There an Acoustic Resonance in the Solar Chromosphere? *M. F. Woodard & K. G. Libbrecht.* 374, L61, 110-E1 (1991)
- Nonfacular Solar Luminosity Variations. *J. R. Kuhn & K. G. Libbrecht.* 381, L35, 194-E1 (1991)
- LICHEN, STEVEN M.** Warm Neutral Halos around Molecular Clouds. II. H I and CO ( $J = 1-0$ ) Observations. *Peter G. Wannier, B-G Andersson, Mark Morris, & Steven M. Lichen.* 75, 987, 16-B1 (1991)
- LIBBERT, JAMES.** The Isolated Massive DA White Dwarf GD 50. *P. Bergeron, K. M. Kidder, J. B. Holberg, James Liebert, F. Wesemael, & Rex A. Saffer.* 372, 267, 77-C5 (1991)
- LIEBING, D. F.** See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- LIGHT, ROBERT M.** See LYNDS, ROGER, et al. NGC 1068: Resolution of Nuclear Structure in the Optical Continuum.
- See HOLTZMAN, JON A., et al. Stellar Photometry with the *Hubble Space Telescope* Wide-Field/Planetary Camera: A Progress Report.
- See LAUER, TOD R., et al. The Core of the Nearby S0 Galaxy NGC 7457 Imaged with the *HST* Planetary Camera.
- See LAUER, TOD R., et al. The Postcollapse Core of M15 Imaged with the *HST* Planetary Camera.
- See WESTPHAL, JAMES A., et al. *Hubble Space Telescope* Wide-Field/Planetary Camera Images of Saturn.
- See HESTER, J. JEFF, et al. Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0''.1.
- LILJE, PER B.** Evolution of Velocity and Density Fields around Clusters of Galaxies. *Per B. Lilje & Ofer Lahav.* 374, 29, 98-D3 (1991)
- LILLY, S. J.** A Change in the Cluster Environments of Radio Galaxies with Cosmic Epoch. *G. J. Hill & S. J. Lilly.* 367, 1, 12-A13 (1991)
- A Deep Imaging and Spectroscopic Survey of Faint Galaxies. *S. J. Lilly, L. L. Cowie, & J. P. Gardner.* 369, 79, 37-A1 (1991)
- LIMON, M.** The Brightness Temperature of the South Celestial Pole and the Temperature of the Cosmic Background Radiation Measured at 36.6 and 12 Centimeter Wavelength. *G. Sironi, G. Bonelli, & M. Limon.* 378, 550, 159-C1 (1991)
- LIMONI, MICHELE.** The Temperature of the Cosmic Microwave Background Radiation at 3.8 GHz: Results of a Measurement from the South Pole Site. *Giovanni De Amici, Marco Bersanelli, Al Kotug, Steve Levin, Michele Limon, & George F. Smoot.* 381, 341, 193-C1 (1991)
- LIMONGI, MARCO.** He Stars and He-accreting CO White Dwarfs. *Marco Limongi & Amedeo Tornambè.* 371, 317, 64-A9 (1991)
- LIN, D. N. C.** Nonlinear Evolution of Accretion Disks Induced by Radiative Feedback Processes. *K. R. Bell, D. N. C. Lin, & Steven P. Ruden.* 372, 633, 83-E7 (1991)
- LIN, DOUGLAS N. C.** Thermal Instabilities in Proto-Globular Clusters Resulting from Time-dependent Potentials. *Stephen D. Murray & Douglas N. C. Lin.* 367, 149, 13-G6 (1991)
- LIN, R. P.** Sulfur-bearing Ions in the Ionosphere of Comet Halley. *M. L. Marconi, D. A. Mendis, D. L. Mitchell, R. P. Lin, A. Korth, & H. Réme.* 378, 756, 161-F7 (1991)
- LIND, KEVIN R.** Heavy, Overpressured Jets and the Radio Source Hercules A. *David L. Meier, Alberto C. Sadun, & Kevin R. Lind.* 379, 141, 164-F9 (1991)
- LINDBLOM, LEE.** The Oscillations of Rapidly Rotating Newtonian Stellar Models. II. Dissipative Effects. *James R. Ipser & Lee Lindblom.* 373, 213, 88-E12 (1991)
- On the Adiabatic Pulsations of Accretion Disks and Rotating Stars. *James R. Ipser & Lee Lindblom.* 379, 285, 166-E7 (1991)
- LINDER, ERIC V.** Fuzzy Correlations of Gamma-Ray Bursts. *Dieter H. Hartmann, Eric V. Linder, & George R. Blumenthal.* 367, 186, 14-D1 (1991)
- LINDLER, DON J.** First Results from the Goddard High-Resolution Spectrograph: A Demonstration of Spectral Resolution and Experiments with Deconvolution. *Glenn M. Wahlgren, David S. Leckrone, Steven N. Shore, Don J. Lindler, Ronald L. Gilliland, & Dennis C. Ebbets.* 377, L41, 143-E6 (1991)
- LINSEY, C. A.** Submillimeter Solar Limb Profiles Determined from Observations of the Total Solar Eclipse of 1988 March 18. *T. L. Roellig, E. E. Becklin, J. T. Jefferies, G. A. Kopp, C. A. Lindsey, F. Q. Orrall, & M. W. Werner.* 381, 288, 192-E5 (1991)
- LINSEY, CHARLES A.** Telescope Beam-Profile Diagnostics and the Solar Limb. *Charles A. Lindsey & Thomas L. Roellig.* 375, 414, 116-A9 (1991)
- The Solar Chromospheric Supergranular Network in 850 Micron Radiation. *Charles A. Lindsey & John T. Jefferies.* 383, 443, 217-G1 (1991)
- LING, J. C.** SMM/HXRBS Observations of Cygnus X-1 from 1986 December to 1988 April. *R. A. Schwartz, L. E. Orwig, B. R. Dennis, J. C. Ling & W. A. Wheaton.* 376, 312, 128-G1 (1991)
- LINGENFELTER, R. E.** Gamma-Ray Lines from Type I Supernovae. *K. W. Chan & R. E. Lingenfelter.* 368, 515, 31-E1 (1991)
- LINGENFELTER, RICHARD E.** Positron Annihilation in the Interstellar Medium. *Nidhal Guessoum, Reuven Ramaty, & Richard E. Lingenfelter.* 378, 170, 153-B4 (1991)
- Compton Backscattered 511 keV Annihilation Line Emission and the 170 keV Line from the Galactic Center Direction. *Richard E. Lingenfelter & Xin-Min Hua.* 381, 426, 196-A10 (1991)
- LINK, BENNETT K.** Mechanics and Energetics of Vortex Unpinning in Neutron Stars. *Bennett K. Link & Richard I. Epstein.* 373, 592, 95-C11 (1991)
- LINNELL, ALBERT P.** A Light Synthesis Study of W Ursae Majoris. *Albert P. Linnell.* 374, 307, 102-A1 (1991)
- The Ultraviolet Light Curves of W Ursae Majoris. *Albert P. Linnell.* 379, 338, 167-C3 (1991)
- Does SV Centauri Harbor an Accretion Disk? *Albert P. Linnell & Xania Scheick.* 379, 721, 173-F7 (1991)
- A Test of the Starspot Hypothesis for W-Type W Ursae Majoris Light Curves. *Albert P. Linnell.* 383, 330, 216-C8 (1991)
- LINSKY, J. L.** Studies of H I and D I in the Local Interstellar Medium: Erratum. *J. Murthy, R. C. Henry, H. W. Moos, A. Vidal-Madjar, J. L. Linsky, & C. Gry.* 378, 455, 156-E8 (1991) (Orig. paper in 356, 223, 101-G5 (1990))
- LINSKY, JEFFREY L.** X-Ray Emission from Hybrid-Chromosphere Stars. *Alexander Brown, Stephen A. Drake, Michael E. Van Steenberg, & Jeffrey L. Linsky.* 373, 614, 95-E9 (1991)
- First Results from the Goddard High-Resolution Spectrograph: The Chromosphere of *o* Tauri. *Kenneth G. Carpenter, Richard D. Robinson, Glenn M. Wahlgren, Thomas B. Ake, Dennis C. Ebbets, Jeffrey L. Linsky, Alexander Brown, & Frederick M. Walter.* 377, L45, 143-E11 (1991)
- IUE Observations of Solar-Type Stars in the Pleiades and the Hyades. *Jean-Pierre Caillaud, Osmi Vilhu, & Jeffrey L. Linsky.* 383, 594, 221-F1 (1991)
- LIPARI, S.** Southern *IRAS* Quasar with Extreme Fe II Emission. *S. Lipari, F. D. Macchetto, & D. Golombek.* 366, L65, 11-C1 (1991)
- LIPARI, SEBASTIAN.** Massive Star Formation and Superwinds in *IRAS* 19254-7245 (The "Superantennae"). *Luis Colina, Sebastian Lipari, & F. Macchetto.* 379, 113, 164-D5 (1991)
- IRAS 02366-3101: An Accretion Disk Candidate among Luminous *IRAS* Galaxies. *Luis Colina, Sebastian Lipari, & F. Macchetto.* 382, L63, 211-B7 (1991)
- LIS, D.** C. Protostellar Condensations in the Core of NGC 2024. *D. C. Lis, J. E. Carlstrom, & T. G. Phillips.* 370, 583, 55-F5 (1991)
- Millimeter Continuum Observations of Galactic Center Giant Molecular Cloud Cores. *D. C. Lis, J. E. Carlstrom, & Jocelyn Keene.* 380, 429, 183-E7 (1991)
- LIS, DARIUSZ C.** High-Density Gas in the Core of the Sagittarius B2 Molecular Cloud. *Dariusz C. Lis & Paul F. Goldsmith.* 369, 157, 37-G11 (1991)
- Size and Density Distribution of Very Small Dust Grains in the Barnard 5 Cloud. *Dariusz C. Lis & Chun Ming Leung.* 372, L107, 85-F9 (1991)
- Location of the Thermal Continuum Source Sagittarius D. *Dariusz C. Lis.* 379, L53, 175-B10 (1991)
- LITES, BRUCE W.** High-Resolution Spectra of Solar Magnetic Features. II. Magnetic Fields of Umbral Brightenings. *Bruce W. Lites,*

- Thomas A. Bida, A. Johannesson, & G. B. Scharmer.* 373, 683, 96-D11 (1991)
- LIU, T.** Radial Velocity Measurements in the Pleiades. *T. Liu, Kenneth A. Janes, & T. M. Bania.* 377, 141, 139-F7 (1991)
- LIU, WEIHONG.** Infrared Dust and Millimeter-Wave Carbon Monoxide Emission in the Orion Region. *John Bally, William D. Langer, & Weihong Liu.* 383, 645, 222-C6 (1991)
- LIVINGSTON, W. C.** Line-blanketing Variations in the Irradiance Spectrum of the Sun from Maximum to Minimum of the Solar Cycle. *W. E. Mitchell, Jr., & W. C. Livingston.* 372, 336, 78-B6 (1991)
- LIVIO, MARIO.** On the Expected Orbital Period Change in the Next Outburst of the Recurrent Nova T Pyxidis. *Mario Livio.* 369, L5, 40-A13 (1991)
- The Common Envelope Phase in Classical Novae: One-dimensional Models. *Anurag Shankar, Mario Livio, & James W. Truran.* 374, 623, 106-G6 (1991)
- The White Dwarf Mass Distribution in Classical Nova Systems. *Hans Ritter, Michael Politano, Mario Livio, & Ronald F. Webbink.* 376, 177, 127-B10 (1991)
- LIVNE, ELI.** Numerical Simulations of Off-Center Detonations in Helium Shells. *Eli Livne & Ami S. Glasner.* 370, 272, 50-E12 (1991)
- LIZANO, SUSANA.** Star Formation and the Nature of Bipolar Outflows. *Frank H. Shu, Steven P. Ruden, Charles J. Lada, & Susana Lizano.* 370, L31, 53-E1 (1991)
- LJEPOJEVIC, N. N.** Non-Maxwellian Electron Distributions in Models of the Solar Atmosphere. *P. MacNeice, J. Fontenla, & N. N. Ljepejovic.* 369, 544, 44-E1 (1991)
- LO, K. Y.** CO (3-2) Mapping and Gas Excitation in the Core of M82. *R. P. J. Tilanus, L. J. Tacconi, E. C. Sutton, S. Zhou, D. B. Sanders, C. G. Wynn-Williams, K. Y. Lo, & S. A. Stephens.* 376, 500, 132-E13 (1991)
- Possible Deflection of a Jet by Molecular Clouds in NGC 4258. *R. L. Plante, K. Y. Lo, Jean-René Roy, Pierre Martin, & Louis Noreau.* 381, 110, 190-D4 (1991)
- The Relationship between the Carbon Monoxide Intensity and the Radio Continuum Emission in Spiral Galaxies. *David S. Adler, Ronald J. Allen, & K. Y. Lo.* 382, 475, 207-D12 (1991)
- LOCHNER, JAMES C.** Shot Model Parameters for Cygnus X-1 through Phase Portrait Fitting. *James C. Lochner, J. H. Swank, & A. E. Szymkowiak.* 376, 295, 128-E9 (1991)
- LOCKMAN, FELIX J.** Vertical Distribution and Support of Galactic H I. *Felix J. Lockman & Curtis S. Gehman.* 382, 182, 202-D12 (1991)
- LOCKWOOD, G. W.** The Brightness, Albedo, and Temporal Variability of Neptune. *G. W. Lockwood, D. T. Thompson, B. L. Lutz, & E. S. Howell.* 368, 287, 26-F1 (1991)
- LOEB, ABRAHAM.** Unsaturated Comptonization of Isotropic Photon Spectra by Relativistic Electrons. *Abraham Loeb, Christopher F. McKee, & Ofer Lahav.* 374, 44, 98-E5 (1991)
- LOESER, R.** Energy Balance in the Solar Transition Region. II. Effects of Pressure and Energy Input on Hydrostatic Models. *J. M. Fontenla, E. H. Avrett, & R. Loeser.* 377, 712, 148-E1 (1991)
- Formation of the Infrared Emission Lines of Mg I in the Solar Atmosphere. *E. S. Chang, E. H. Avrett, P. J. Mauas, R. W. Noyes, & R. Loeser.* 379, L79, 175-E1 (1991)
- LOEWENSTEIN, MICHAEL.** Hot Gas Metallicity and the History of Supernova Activity in Elliptical Galaxies. *Michael Loewenstein & William G. Mathews.* 373, 445, 93-D11 (1991)
- Cosmic-Ray Heating of Cooling Flows: A Critical Analysis. *Michael Loewenstein, Ellen G. Zweibel, & Mitchell C. Begelman.* 377, 392, 144-F4 (1991)
- LOH, E. C.** See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- LONG, K. S.** See FELDMAN, P. D., et al. Observations of Comet Levy (1990c) with the Hopkins Ultraviolet Telescope.
- See MOOS, H. W., et al. Determination of Ionic Abundances in the Io Torus Using the Hopkins Ultraviolet Telescope.
- LONG, KNOX S.** A Detailed Optical Study of Kepler's Supernova Remnant. *William P. Blair, Knox S. Long, & Olaf Vancura.* 366, 484, 9-A1 (1991)
- Supernova Remnant Evolution in an Interstellar Medium with Evaporating Clouds. *Richard L. White & Knox S. Long.* 373, 543, 94-F7 (1991)
- W28 and 3C 400.2: Two Shell-like Radio Supernova Remnants with Centrally Peaked X-Ray Morphologies. *Knox S. Long, William P. Blair, Richard L. White, & Yutaka Matsui.* 373, 567, 95-A10 (1991)
- Far-Ultraviolet Mapping of the Cygnus Loop with the Voyager 2 Ultraviolet Spectrometer. *William P. Blair, Knox S. Long, Olaf Vancura, & J. B. Holberg.* 374, 202, 100-E5 (1991)
- See BLAIR, WILLIAM P., et al. Discovery of a Fast Radiative Shock Wave in the Cygnus Loop Using the Hopkins Ultraviolet Telescope.
- Spectroscopy of Z Camelopardalis in Outburst with the Hopkins Ultraviolet Telescope. *Knox S. Long, William P. Blair, Arthur E. Davidsen, Charles W. Bowers, W. Van Dyke Dixon, Samuel T. Durrance, Paul D. Feldman, Richard C. Henry, Gerard A. Kriss, Jeffrey W. Kruk, H. Warren Moos, Olaf Vancura, Henry C. Ferguson, & Randy A. Kimble.* 381, L25, 194-D5 (1991)
- See FERGUSON, HENRY C., et al. Constraints on the Origin of the Ultraviolet Upturn in Elliptical Galaxies from Hopkins Ultraviolet Telescope Observations of NGC 1399.
- LONGO, MICHAEL J.** Evidence for Structure in the Distribution of Active Galactic Nuclei with  $z < 0.05$ . *Michael J. Longo.* 372, L59, 85-B11 (1991)
- LONSDALE, C. J.** See SOIFER, B. T., et al. Near-Infrared Observations of the  $z \sim 2.3$  IRAS Source FSC 10214+4724.
- Milliarcsecond Radio Structure of Weak-lined T Tauri Stars. *R. B. Phillips, C. J. Lonsdale, & E. D. Feigelson.* 382, 261, 203-D9 (1991)
- LÓPEZ, R.** SN 1988A in M58: Departure from  $^{56}\text{Co}$  Decay 700 Days after Explosion. *P. Ruiz-Lapuente, M. Kidger, G. Gómez, R. Canal, & R. López.* 378, L41, 162-E1 (1991)
- LÓPEZ, ROSARIO.** A Double Radio Source at the Center of the Outflow in L723. *Guillermo Anglada, Robert Estalella, Luis F. Rodríguez, José M. Torrelles, Rosario López, & Jorge Cantó.* 376, 615, 134-A7 (1991)
- LOPRESTO, JAMES C.** Solar Gravitational Redshift from the Infrared Oxygen Triplet. *James C. LoPresto, Charles Schrader, & A. Keith Pierce.* 376, 757, 135-F11 (1991)
- LORD, STEVEN D.** Orbit Crowding of Molecular Gas at a Bar-Spiral Arm Transition Zone in M83. *Jeffrey D. P. Kenney & Steven D. Lord.* 381, 118, 190-D13 (1991)
- A Molecular Gas Ridge Offset from the Dust Lane in a Spiral Arm of M83. *Steven D. Lord & Jeffrey D. P. Kenney.* 381, 130, 190-E13 (1991)
- LORENZ, H.** Is the Standard Elliptical NGC 3379 a Triaxial Disk Galaxy? *M. Capaccioli, M. Vietri, E. V. Held, & H. Lorenz.* 371, 535, 68-B12 (1991)
- LOU, YU-QING.** On the Subadiabatic Magnetohydrodynamic Instability in Background Polytropes. *Yu-Qing Lou.* 367, 367, 16-E9 (1991)
- LOVELACE, R. V. E.** Magnetically Driven Jets and Winds. *R. V. E. Lovelace, H. L. Berk, & J. Contopoulos.* 379, 696, 173-D1 (1991)
- LOW, B. C.** Three-dimensional Structures of Magnetostatic Atmospheres. III. A General Formulation. *B. C. Low.* 370, 427, 52-E8 (1991)
- On the Spontaneous Formation of Electric Current Sheets above a Flexible Solar Photosphere. *B. C. Low.* 381, 295, 192-F1 (1991)
- LOW, FRANK J.** See SHIBAI, HIROSHI, et al. Large-Scale [C II] 158 Micron Emission from the Galaxy.
- An Infrared/Optical Investigation of 100 Micron "Cirrus." *Elizabeth S. Paley, Frank J. Low, John T. McGraw, Roc M. Cutri, & Hans-Walter Rix.* 376, 335, 129-A13 (1991)
- LOWE, R. P.** Emission Features in the Spectrum of NGC 7027 near 3.3 Microns at Very High Resolution. *R. P. Lowe, J. M. Moorhead, W. H. Wehlau, & J.-P. Maillard.* 368, 195, 25-E1 (1991)
- LOWENTHAL, JAMES.** Emission from the  $z = 2$  Damped Ly $\alpha$  Absorber toward Q1215+333. *Richard Elston, Jill Bechtold, James Lowenthal, & Marcia Rieke.* 373, L39, 97-B1 (1991)
- LOWENTHAL, JAMES D.** Discovery of a Ly $\alpha$  Galaxy near a Damped Ly $\alpha$  Absorber at  $z = 2.3$ . *James D. Lowenthal, Craig J. Hogan, Richard F. Green, Adeline Caulet, Bruce E. Woodgate, Larry Brown, & Craig B. Foltz.* 377, L73, 150-C1 (1991)

- LU, EDWARD. Reconstructing the Primordial Spectrum of Fluctuations of the Universe from the Observed Nonlinear Clustering of Galaxies. *A. J. S. Hamilton, P. Kumar, Edward Lu, & Alex Mathews.* 374, L1, 103-B7 (1991)
- The Location of the Source of High-Frequency Solar Acoustic Oscillations. *Pawan Kumar & Edward Lu.* 375, L35, 117-D12 (1991)
- LU, EDWARD T. Avalanches and the Distribution of Solar Flares. *Edward T. Lu & Russell J. Hamilton.* 380, L89, 188-F5 (1991)
- LU, LIMIN. The Redshift Distribution of Ly $\alpha$  Clouds and the Proximity Effect. *Limin Lu, Arthur M. Wolfe, & David A. Turnshek.* 367, 19, 12-C5 (1991)
- A New Spectroscopic Survey for Damped Ly $\alpha$  Absorption Lines from High-Redshift Galaxies. *Kenneth M. Lanzetta, Arthur M. Wolfe, David A. Turnshek, Limin Lu, Richard G. McMahon, & Cyril Hazard.* 77, 1, 43-B1 (1991)
- The Carbon Abundance of the Lyman-Alpha Clouds. *Limin Lu.* 379, 99, 164-C1 (1991)
- LU, X-Q. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- LUBIN, P. See SMOOTH, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- LUBIN, P. M. See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a 7° Beam by the *Cosmic Background Explorer* (COBE).
- LUBIN, PHILIP. A Medium-Scale Measurement of the Cosmic Microwave Background at 3.3 Millimeters. *Peter Meinhold & Philip Lubin.* 370, L11, 53-C1 (1991)
- Limits on Cold Dark Matter Cosmologies from New Anisotropy Bounds on the Cosmic Microwave Background. *Nicola Vittorio, Peter Meinhold, Pio Francesco Muciaccia, Philip Lubin, & Joseph Silk.* 372, L1, 79-A7 (1991)
- LUBOW, S. H. The Effect of an External Disk on the Orbital Elements of a Central Binary. *P. Artymowicz, C. J. Clarke, S. H. Lubow, & J. E. Pringle.* 370, L35, 53-E7 (1991)
- LUBOW, STEPHEN H. A Model for Tidally Driven Eccentric Instabilities in Fluid Disks. *Stephen H. Lubow.* 381, 259, 192-B12 (1991)
- Simulations of Tidally Driven Eccentric Instabilities with Application to Superhumps. *Stephen H. Lubow.* 381, 268, 192-C9 (1991)
- LUBOWICH, D. A. H<sub>2</sub>CO in IC 443G: Unusual Excitation and a Diagnostic of Shock Astrochemistry. *B. E. Turner & D. A. Lubowich.* 381, 173, 191-B9 (1991)
- LUCK, R. EARLE. Chemical Abundances for Cyanogen-weak Giants. *R. Earle Luck.* 57, 579, 8-F11 (1991)
- Lithium Abundances in Carbon Stars. *Grant R. Denn, R. Earle Luck, & David L. Lambert.* 377, 657, 147-G5 (1991)
- Subgiant CH Stars. II. Chemical Compositions and the Evolutionary Connection with Barium Stars. *R. Earle Luck & Howard E. Bond.* 77, 515, 51-G1 (1991)
- LUCY, L. B. Nonthermal Excitation of Helium in Type Ib Supernovae. *L. B. Lucy.* 383, 308, 216-A8 (1991)
- LUGTEN, J. B. The 158 Micron [C II] Line: A Measure of Global Star Formation Activity in Galaxies. *G. J. Stacey, N. Geis, R. Genzel, J. B. Lugten, A. Poglitsch, A. Sternberg, & C. H. Townes.* 373, 423, 93-C1 (1991)
- LUND, P. A. Relative Abundances in the Lower Solar Transition Region. *G. A. Doschek, K. P. Dere, & P. A. Lund.* 381, 583, 198-A1 (1991)
- LUNDQVIST, PETER. Circumstellar Emission from SN 1987A. *Peter Lundqvist & Claes Fransson.* 380, 575, 185-D1 (1991)
- LUO, DING. Supernova Remnant 1987A. *Ding Luo & Richard McCray.* 372, 194, 76-D1 (1991)
- The Circumstellar Shell of SN 1987A. *Ding Luo & Richard McCray.* 379, 659, 172-G9 (1991)
- LUTZ, B. L. The Brightness, Albedo, and Temporal Variability of Neptune. *G. W. Lockwood, D. T. Thompson, B. L. Lutz, & E. S. Howell.* 368, 287, 26-F1 (1991)
- LUTZ, BARRY L. Gas and Dust Production by Comet P/Halley (1910 II). *Ellen S. Howell, Barry L. Lutz, & V. M. Slipher.* 371, 776, 71-B11 (1991)
- LYNCH, DAVID K. The 0.46–1.3 Micron Spectrum of the Planetary Nebula BD +30°3639. *Richard J. Rudy, Ross D. Cohen, George S. Rossano, Peter Erwin, R. C. Puettner, & David K. Lynch.* 380, 151, 178-A1 (1991)
- LYNCH, JOHN P. Forbidden Lines of np<sup>q</sup> Ions. II. Line Intensities. *John P. Lynch & Menas Kafatos.* 76, 1169, 41-F7 (1991)
- LYNDEN-BELL, DONALD. Global Stability of Self-similar Newtonian Gaseous Disks against Axisymmetric Perturbations. *Jost P. S. Lemos, Agris J. Kalnajs, & Donald Lynden-Bell.* 375, 484, 118-G1 (1991)
- LYNDS, C. R. The Imaging Performance of the *Hubble Space Telescope*. *Christopher J. Burrows, Jon A. Holtzman, S. M. Faber, Pierre Y. Bely, Hashima Hasan, C. R. Lynds, & Daniel Schroeder.* 369, L21, 45-C1 (1991)
- LYNDS, C. ROGER. See LAUER, TOD R., et al. The Core of the Nearby S0 Galaxy NGC 7457 Imaged with the *HST* Planetary Camera. See LAUER, TOD R., et al. The Postcollapse Core of M15 Imaged with the *HST* Planetary Camera.
- LYNDS, ROGER. NGC 1068: Resolution of Nuclear Structure in the Optical Continuum. *Roger Lynds, S. M. Faber, Edward J. Groth, Jon A. Holtzman, Robert M. Light, Earl J. O'Neil, Jr., William A. Baum, Douglas G. Currie, S. P. Ewald, J. Jeff Hester, Jerome A. Kristian, P. Kenneth Seidelmann, Edward J. Shaya, & James A. Westphal.* 369, L31, 45-D1 (1991)
- See HOLTZMAN, JON A., et al. Stellar Photometry with the *Hubble Space Telescope* Wide-Field/Planetary Camera: A Progress Report.
- See WESTPHAL, JAMES A., et al. *Hubble Space Telescope* Wide-Field/Planetary Camera Images of Saturn.
- See HESTER, J. JEFF, et al. Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0''.1.
- LYNE, A. G. X-Ray and Radio Pulse Phase Comparison for PSR 1509–58. *N. Kawai, R. Okayasu, W. Brinkmann, R. Manchester, A. G. Lyne, & N. D'Amico.* 383, L65, 226-D12 (1991)
- LYONS, RONALD W. See BEAVER, E. A., et al. Far-Ultraviolet Spectroscopy of the Quasar UM 675 with the Faint Object Spectrograph on the *Hubble Space Telescope*.
- LYU, CHENG-HSUAN. First Results from the Goddard High-Resolution Spectrograph: C I, S I, and CO toward ξ Persei and the Physical Conditions in Diffuse Clouds. *Andrew M. Smith, Frederick C. Bruhweiler, David L. Lambert, Blair D. Savage, Jason A. Cardelli, Dennis C. Ebbets, Cheng-Hsuan Lyu, & Yaron Sheffer.* 377, L61, 143-G1 (1991)
- MACALPINE, G. M. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- MACCACARO, T. The Number Count Distribution for X-Ray-selected BL Lacertae Objects and Constraints on the Luminosity Function. *Anna Wolter, I. M. Gioia, T. Maccacaro, S. L. Morris, & J. T. Stocke.* 369, 314, 41-F3 (1991)
- The *Einstein Observatory* Extended Medium-Sensitivity Survey. II. The Optical Identifications. *John T. Stocke, Simon L. Morris, I. M. Gioia, T. Maccacaro, R. Schild, A. Wolter, Thomas A. Fleming, & J. Patrick Henry.* 76, 813, 36-B1 (1991)
- MACCACARO, TOMMASO. The Properties of X-Ray-selected Active Galactic Nuclei. I. Luminosity Function, Cosmological Evolution, and Contribution to the Diffuse X-Ray Background. *Tommaso Maccacaro, Roberto Della Ceca, Isabella M. Gioia, Simon L. Morris, John T. Stocke, & Anna Wolter.* 374, 117, 99-D11 (1991)
- The Luminosity Function and Cosmological Evolution of X-Ray-selected BL Lacertae Objects. *Simon L. Morris, John T. Stocke, Isabella M. Gioia, Rudy E. Schild, Anna Wolter, Tommaso Maccacaro, & Roberto Della Ceca.* 380, 49, 176-F1 (1991)
- MACCALLUM, C. J. GRIS Observations of <sup>26</sup>Al Gamma-Ray Line Emission from Two Points in the Galactic Plane. *B. J. Teegarden, S. D. Barthelmy, N. Gehrels, J. Tueller, M. Leventhal, & C. J. MacCallum.* 375, L9, 117-B4 (1991)
- GRIS Observations of Positron Annihilation Radiation from the Galactic Center. *N. Gehrels, S. D. Barthelmy, B. J. Teegarden,*

- J. Tueller, M. Levenshal, & C. J. MacCallum. 375, L13, 117-B10 (1991)
- MACCHETTO, F. First Results from the Faint Object Camera: Observations of PKS 0521-36. *F. Macchetto, R. Albrecht, C. Barbieri, J. C. Blades, A. Boksenberg, P. Crane, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kamperman, I. R. King, C. D. Mackay, F. Paresce, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, & W. B. Sparks.* 369, L55, 46-A1 (1991)
- See CRANE, P., et al. First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305.
- See JAKOBSEN, P., et al. First Results from the Faint Object Camera: SN 1987A.
- See PARESCHE, F., et al. First Results from the Faint Object Camera: Imaging the Core of R Aquarii.
- IC 5063: A Merger Remnant with a Hidden Luminous Active Nucleus. *L. Colina, W. B. Sparks, & F. Macchetto.* 370, 102, 48-C5 (1991)
- HST Observations of 3C 66B: A Double-stranded Optical Jet. *F. Macchetto, R. Albrecht, C. Barbieri, J. C. Blades, A. Boksenberg, P. Crane, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kamperman, I. R. King, C. D. Mackay, F. Paresce, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, W. B. Sparks, & G. K. Miley.* 373, L55, 97-C10 (1991)
- See ALBRECHT, R., et al. First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System.
- See WEIGELT, G., et al. First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.
- Massive Star Formation and Superwinds in IRAS 19254-7245 (The "Supernantennae"). *Luis Colina, Sebastian Lipari, & F. Macchetto.* 379, 113, 164-D5 (1991)
- Properties of the SN 1987A Circumstellar Ring and the Distance to the Large Magellanic Cloud. *N. Panagia, R. Gilmozzi, F. Macchetto, H.-M. Adorf, & R. P. Kirshner.* 380, L23, 181-D1 (1991)
- A Radio-quiet Galaxy at Redshift  $z = 3.409$ . *D. A. Turnshek, F. Macchetto, M. V. Bencke, C. Hazard, W. B. Sparks, & R. G. McMahon.* 382, 26, 200-D1 (1991)
- IRAS 02366-3101: An Accretion Disk Candidate among Luminous IRAS Galaxies. *Luis Colina, Sebastian Lipari, & F. Macchetto.* 382, L63, 211-B7 (1991)
- MACCHETTO, F. D. Southern IRAS Quasar with Extreme Fe II Emission. *S. Lipari, F. D. Macchetto, & D. Golombek.* 366, L65, 11-C1 (1991)
- MACCONNELL, D. JACK. Three Newly Recognized Dwarf Carbon Stars. *Paul J. Green, Bruce Margon, & D. Jack MacConnell.* 380, L31, 181-E1 (1991)
- MACDONALD, DAN. X-Ray Emission from Starburst Galaxies. *Yoel Rephaeli, Duane Gruber, Massimo Persic, & Dan MacDonald.* 380, L59, 188-C1 (1991)
- MACDONALD, J. Inefficient Accretion by the DA2 White Dwarf in V471 Tauri. *D. J. Mullan, H. L. Shipman, E. M. Sion, & J. MacDonald.* 374, 707, 107-G8 (1991)
- MACDONALD, JAMES. How Much Hydrogen Is There in a White Dwarf? *James MacDonald & Stéphane Vennes.* 371, 719, 70-E1 (1991)
- Accurate Collision Integrals for the Attractive Static Screened Coulomb Potential with Application to Electrical Conductivity. *James MacDonald.* 76, 369, 29-F3 (1991)
- Thermal X-Ray Emission from Classical Novae in Optical Decline. *James McDonald & Stéphane Vennes.* 373, L51, 97-C4 (1991)
- Neutrino-heated Stars and Broad-Line Emission from Active Galactic Nuclei. *James McDonald, Todor Stanev, & Peter L. Biermann.* 378, 30, 151-D4 (1991)
- MACDONALD, JIM. Diffusion and Mixing in Classical Nova Precursors. *Icko Iben, Jr., Masayuki Y. Fujimoto, & Jim McDonald.* 375, L27, 117-D1 (1991)
- MACFARLANE, J. J. Predicted Extreme-Ultraviolet Line Emission for Nearby Main-Sequence B Stars. *J. J. MacFarlane, J. P. Cassinelli, B. Y. Welsh, P. W. Vedder, J. V. Vallerga, & W. L. Waldron.* 380, 564, 185-C1 (1991)
- MACGIBBON, JANE H. Cosmic Rays from Primordial Black Holes. *Jane H. MacGibbon & B. J. Carr.* 371, 447, 67-B5 (1991)
- MACGILLIVRAY, HARVEY. A COSMOS Study of the Structure and Content of NGC 6822. *Paul Hodge, Toby Smith, Paul Eskridge, Harvey MacGillivray, & Steven Beard.* 379, 621, 172-D1 (1991)
- MACGILLIVRAY, HARVEY T. A Cosmos Study of IC 1613. *Paul W. Hodge, Toby R. Smith, Paul B. Eskridge, Harvey T. MacGillivray, & Steven M. Beard.* 369, 372, 42-D5 (1991)
- MACGREGOR, K. B. Rotational Evolution of Solar-Type Stars. I. Main-Sequence Evolution. *K. B. MacGregor & M. Brenner.* 376, 204, 127-D13 (1991)
- MACHO COLLABORATION, THE. See GRIEST, KIM, et al. Gravitational Microlensing as a Method of Detecting Disk Dark Matter and Faint Disk Stars.
- MACKAY, C. D. See MACCHETTO, F., et al. First Results from the Faint Object Camera: Observations of PKS 0521-36.
- See CRANE, P., et al. First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305.
- See JAKOBSEN, P., et al. First Results from the Faint Object Camera: SN 1987A.
- See PARESCHE, F., et al. First Results from the Faint Object Camera: Imaging the Core of R Aquarii.
- See MACCHETTO, F., et al. HST Observations of 3C 66B: A Double-stranded Optical Jet.
- See ALBRECHT, R., et al. First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System.
- See WEIGELT, G., et al. First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.
- MACLENNAN, C. G. Statistical Properties of Shock-accelerated Ions in the Outer Heliosphere. *L. J. Lanzerotti, R. E. Gold, D. J. Thomson, R. E. Decker, C. G. MacLennan, & S. M. Krimigis.* 380, L93, 188-F10 (1991)
- MAC LOW, MORDECAI-MARK. Bow Shock Models of Ultracompact H II Regions. *Mordecai-Mark Mac Low, Dave Van Buren, Douglas O. S. Wood, & Ed Churchwell.* 369, 395, 42-F1 (1991)
- Expansion of a Superbubble in a Uniform Magnetic Field. *Katia M. Ferriere, Mordecai-Mark Mac Low, & Ellen G. Zweibel.* 375, 239, 114-A4 (1991)
- MACNEICE, P. Non-Maxwellian Electron Distributions in Models of the Solar Atmosphere. *P. MacNeice, J. Fontenla, & N. N. Ljepojevic.* 369, 544, 44-E1 (1991)
- MACOMB, D. J. Search for TeV Emission from 4U 0115+63. *D. J. Macomb, M. F. Cawley, D. J. Fegan, A. M. Hillas, P. W. Kwok, R. C. Lamb, M. J. Lang, D. A. Lewis, P. T. Reynolds, G. Vacanti, & T. C. Weekes.* 376, 738, 135-D12 (1991)
- See VACANTI, G., et al. Gamma-Ray Observations of the Crab Nebula at TeV Energies.
- See REYNOLDS, P. T., et al. Search for TeV Gamma-Ray Emission from Hercules X-1.
- MADAU, PIERO. The Hydrodynamics of Relict Cosmological H II Regions and the Formation of Objects at High Redshift. *Piero Madau & Avery Meiksin.* 374, 6, 98-B7 (1991)
- QSO Absorption Systems and the Origin of the Ionizing Background at High Redshift. *Piero Madau.* 376, L33, 137-B4 (1991)
- MADDEN, S. C. The Optical Depth of the 158 Micron [ $^{12}\text{C}$  II] Line: Detection of the  $F = 1 - 0$  [ $^{13}\text{C}$  II] Hyperfine-Structure Component. *G. J. Stacey, C. H. Townes, A. Poglitsch, S. C. Madden, J. M. Jackson, F. Herrmann, R. Genzel, & N. Geis.* 382, L37, 205-E1 (1991)
- MADEJ, JERZY. Model Atmospheres and X-Ray Spectra of Bursting Neutron Stars. *Jerzy Madej.* 376, 161, 127-A4 (1991)
- MADEJSKI, G. M. Einstein Observatory SSS and MPC Observations of the Complex X-Ray Spectra of Seyfert Galaxies. *T. J. Turner, K. A. Weaver, R. F. Mushotzky, S. S. Holt, & G. M. Madejski.* 381, 85, 190-B1 (1991)
- MADEJSKI, GREG M. A Ubiquitous Absorption Feature in the X-Ray Spectra of BL Lacertae Objects. *Greg M. Madejski, Richard F. Mushotzky, Kimberly A. Weaver, Keith A. Arnaud, & C. Megan Urry.* 370, 198, 49-F1 (1991)
- MADORE, BARRY F. New Cepheid Distances to Nearby Galaxies Based on BVRI CCD Photometry. II. The Local Group Galaxy M33. *Wendy L. Freedman, Christine D. Wilson, & Barry F. Madore.* 372, 455, 81-D9 (1991)

- MADSEN, JES. Zero Central Density Solutions of the Anisotropic Jeans Equation and Neutrino Dark Matter. *Jes Madsen*. 367, 507, 19-F1 (1991)
- Bosons: Hot Dark Matter with Small-Scale Power. *Jes Madsen*. 371, L47, 73-A11 (1991)
- MAEDER, A. Wolf-Rayet Stars as Starting Points or as Endpoints of the Evolution of Massive Stars? *H. J. G. L. M. Lamers, A. Maeder, W. Schmutz, & J. P. Cassinelli*. 368, 538, 31-F12 (1991)
- MAGALHÃES, A. M. On the Wind Geometry of the Wolf-Rayet Star EZ Canis Majoris. *R. E. Schulte-Ladbeck, K. H. Nordsieck, M. Taylor, M. A. Nook, K. S. Bjorkman, A. M. Magalhães, & C. M. Anderson*. 382, 301, 204-A1 (1991)
- See TAYLOR, M., et al. First Ultraviolet Spectropolarimetry of Hot Supergiants.
- See BJORKMAN, K. S., et al. First Ultraviolet Spectropolarimetry of Be Stars from the Wisconsin Ultraviolet Photo-Polarimeter Experiment.
- MAGGIOLI, P. See PEROTTI, F., et al. Hard X-Ray Variability of NGC 4151.
- MAGRIS, C., GLADIS. Irradiation of Accretion Disks around Young Objects. I. Near-Infrared CO Bands. *Nuria Calvet, Alberto Patiño, Gladis Magris C., & Paola D'Alessio*. 380, 617, 185-G8 (1991)
- MAHONEY, W. A. HEAO 3 Upper Limits to Pulsed Gamma-Ray Emission from PSR 1509-58 and PSR 0833-45. *M. P. Ulmer, W. R. Purcell, W. A. Wheaton, & W. A. Mahoney*. 369, 485, 43-F12 (1991)
- MAIHARA, TOSHINORI. See SHIBAI, HIROSHI, et al. Large-Scale [C II] 158 Micron Emission from the Galaxy.
- MAILLARD, J.-P. Emission Features in the Spectrum of NGC 7027 near 3.3 Microns at Very High Resolution. *R. P. Lowe, J. M. Moorhead, W. H. Wehlau, & J.-P. Maillard*. 368, 195, 25-E1 (1991)
- Episodic Outflows from High-Mass Protostars. *G. F. Mitchell, J.-P. Maillard, & T. I. Hasegawa*. 371, 342, 64-D1 (1991)
- MAKINO, F. See KII, T., et al. X-Ray Continuum and Evidence for an Iron Emission Line from the Quasar E1821+643.
- See COWLEY, A. P., et al. Discovery of a Long-Term Periodic Variation in LM CX-3.
- MAKINO, JUNICHIRO. Optimal Order and Time-Step Criterion for Aarseth-Type N-Body Integrators. *Junichiro Makino*. 369, 200, 38-D7 (1991)
- Star Cluster Evolution with Primordial Binaries. II. Detailed Analysis. *Steve McMillan, Piet Hut, & Junichiro Makino*. 372, 111, 75-D5 (1991)
- On Core Collapse. *Junichiro Makino & Piet Hut*. 383, 181, 214-C9 (1991)
- MAKISHIMA, K. Ginga Observation of an AM Herculis Type Source H0538+608. *M. Ishida, A. Silber, H. V. Bradt, R. A. Remillard, K. Makishima, & T. Ohashi*. 367, 270, 15-D6 (1991)
- See KII, T., et al. X-Ray Continuum and Evidence for an Iron Emission Line from the Quasar E1821+643.
- See TAN, J., et al. Changes in the 11 Minute Period of 4U 1820-30.
- See NAGASE, F., et al. Cyclotron Line Features in the Spectrum of the Transient X-Ray Pulsar X0115+634.
- See KOYAMA, K., et al. An X-Ray Pulsator in the Direction of Molecular Cloud BM 12 (Lynds 1457).
- Discovery of a Cyclotron Resonance Feature at 30 keV from the Transient X-Ray Pulsar Cepheus X-4. *T. Mihara, K. Makishima, S. Kamijo, T. Ohashi, F. Nagase, Y. Tanaka, & K. Koyama*. 379, L61, 175-C6 (1991)
- MALAGOLI, ANDREA. Turbulent Compressible Convection. *Fausto Cattaneo, Nicholas H. Brummell, Juri Toomre, Andrea Malagoli, & Neal E. Hurlbut*. 370, 282, 50-F10 (1991)
- MALAMA, YU. G. The Influence of the Interface between the Heliosphere and the Local Interstellar Medium on the Penetration of the H Atoms to the Solar System. *V. B. Baranov, M. G. Lebedev, & Yu. G. Malama*. 375, 347, 115-C1 (1991)
- MALANEY, ROBERT A. Neutrino Oscillations and the Leptonic Charge of the Universe. *Martin J. Savage, Robert A. Malaney, & George M. Fuller*. 368, 1, 23-B1 (1991)
- Signatures of Inhomogeneity in the Early Universe. *Lawrence H. Kawano, William A. Fowler, Ralph W. Kavanagh, & Robert A. Malaney*. 372, 1, 74-A11 (1991)
- Signatures of Inhomogeneity in the Early Universe: Erratum. *Lawrence H. Kawano, William A. Fowler, Ralph W. Kavanagh, & Robert A. Malaney*. 382, 358, 204-E13 (1991) (Orig. paper in 372, 1, 74-A11 (1991))
- MALARODA, STELLA. Spectroscopic Binaries in the Open Cluster Trumpler 16. *Hugo Levato, Stella Malaroda, Nidia Morrell, Beatriz García, & Carlos Hernández*. 75, 869, 13-C13 (1991)
- MALBET, FABIEN. The Vertical Structure of T Tauri Accretion Disks. I. Heating by the Central Star. *Fabien Malbet & Claude Bertout*. 383, 814, 224-D1 (1991)
- MALGUIN, A. S. See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- MALIK, G. P. Recalculation of Radial Matrix Integrals for the Electric Dipole Transitions in Hydrogen. *G. P. Malik, Usha Malik, & Vijaya S. Varma*. 371, 418, 65-D1 (1991)
- On Solar Emission Lines. *G. P. Malik, L. K. Pande, & Vijaya S. Varma*. 379, 788, 174-E1 (1991)
- MALIK, USHA. Recalculation of Radial Matrix Integrals for the Electric Dipole Transitions in Hydrogen. *G. P. Malik, Usha Malik, & Vijaya S. Varma*. 371, 418, 65-D1 (1991)
- MALIN, DAVID F. Extremely Low Surface Brightness Galaxies in the Fornax Cluster: Properties, Stability, and Luminosity Fluctuations. *Gregory D. Bothun, Christopher D. Impey, & David F. Malin*. 376, 404, 131-D10 (1991)
- MALINIE, G. Inhomogeneous Halo Collapse and Early Galactic Chemical Evolution: Globular Cluster Metallicities. *G. Malinie, D. H. Hartmann, & G. J. Mathews*. 376, 520, 132-G9 (1991)
- MALKAN, M. Coordinated X-Ray, Ultraviolet, and Optical Observations of 3C 120. *L. Maraschi, L. Chiappetti, R. Falomo, B. Garilli, M. Malkan, G. Tagliaferri, E. G. Tanzi, & A. Treves*. 368, 138, 24-F9 (1991)
- MALKAN, M. A. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- Ultraviolet Variability of NGC 5548: Dynamics of the Continuum Production Region and Geometry of the Broad-Line Region. *J. H. Krolik, Keith Horne, T. R. Kallman, M. A. Malkan, R. A. Edelson, & G. A. Kriss*. 371, 541, 68-C6 (1991)
- MALOFEEV, VALERII M. Microstructure-determined Pulsar Dispersion Measures and the Problem of Profile Alignment. *Timothy H. Hankins, Vera A. Izvekova, Valerii M. Malofeev, Joanna M. Rankin, Yuri P. Shitov, & Daniel R. Stinebring*. 373, L17, 91-C1 (1991)
- MAMON, G. A. The Formation of Molecules in Protostellar Winds. *A. E. Glassgold, G. A. Mamom, & P. J. Huggins*. 373, 254, 89-B7 (1991)
- MANCHADO, ARTURO. The Multiple-Shell Structure of the Planetary Nebula NGC 6751. *You-Hua Chu, Arturo Manchado, George H. Jacoby, & Karen B. Kwinter*. 376, 150, 126-F13 (1991)
- MANCHANDA, R. K. Low-Flux Hard X-Ray Observation of Cygnus X-1. *P. Ubertini, A. Bazzano, C. La Padula, R. K. Manchanda, V. F. Polcaro, R. Stauber, E. Kendziorra, & F. Perotti*. 383, 263, 215-D9 (1991)
- MANCHESTER, R. X-Ray and Radio Pulse Phase Comparison for PSR 1509-58. *N. Kawai, R. Okayasu, W. Brinkmann, R. Manchester, A. G. Lyne, & N. D'Amico*. 383, L65, 226-D12 (1991)
- MANDEL, GREGORY N. Rotation Periods for Seven Stars in the Trapezium Cluster. *Gregory N. Mandel & William Herbst*. 383, L75, 226-E11 (1991)
- MANDROU, P. See MASSARO, E., et al. Detection of a Feature at 0.44 MeV in the Crab Pulsar Spectrum with FIGARO II: A Redshifted Positron Annihilation Line?
- See BARRET, D., et al. Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2.
- See BOUCHET, L., et al. SIGMA Discovery of Variable  $e^+e^-$  Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7-2942.
- See SUNYAEV, R., et al. Three Spectral States of 1E 1740.7-2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature.

- MANGUM, J. G. Detection of Interstellar H<sub>3</sub>O<sup>+</sup>: A Confirming Line. *Abwyn Wootten, J. G. Mangum, B. E. Turner, M. Bogey, F. Boulanger, F. Combes, P. J. Encrenaz, & M. Gerin.* 380, L79, 188-E6 (1991)
- MANGUM, JEFFREY G. Fossil DCN in Orion-KL. *Jeffrey G. Mangum, Richard L. Plambeck, & Abwyn Wootten.* 369, 169, 38-A1 (1991)
- Synthesis Imaging of the DR 21(OH) Cluster. I. Dust Continuum and C<sup>18</sup>O Emission. *Jeffrey G. Mangum, Abwyn Wootten, & Lee G. Mundy.* 378, 576, 159-E3 (1991)
- MANN, J. B. Integral and Differential Cross Sections for Electron Impact Ionization. *R. E. H. Clark, J. Abdallah, Jr., & J. B. Mann.* 381, 597, 198-B9 (1991)
- MANNHEIM, PHILIP D. General Structure of the Gravitational Equations of Motion in Conformal Weyl Gravity. *Demosthenes Kazanas & Philip D. Mannheim.* 76, 431, 31-B1 (1991)
- MANNUCCI, F. Modeling an Accretion Disk in NGC 985. *R. M. Stanga, J. M. Rodriguez Espinosa, & F. Mannucci.* 379, 592, 172-A9 (1991)
- MANTEIGA, M. The Galactic Globular Cluster System: Theoretical Constraints for  $\alpha$ -enhanced Compositions. *D. Bencivelli, F. Caputo, M. Manteiga, & M. L. Quarta.* 380, 484, 184-C1 (1991)
- MAO, SHUDE. Gravitational Microlensing by Double Stars and Planetary Systems. *Shude Mao & Bohdan Paczyński.* 374, L37, 110-B1 (1991)
- Statistics of Gravitational Lenses: The Uncertainties. *Shude Mao.* 380, 9, 176-B9 (1991)
- MAOZ, D. High-Rate Active Galaxy Monitoring at the Wise Observatory. III. The Broad-Line Region of NGC 4151. *D. Maoz, H. Netzer, T. Mazeh, S. Beck, E. Almoznino, E. Leibowitz, N. Brosch, H. Mendelson, & A. Laor.* 367, 493, 19-E1 (1991)
- See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- MAOZ, EYAL. What Damps Small Perturbations in Stellar Systems? *Eyal Maoz.* 375, 687, 121-C1 (1991)
- MARAN, S. P. Observations of the Peculiar Object MWC 560 in Outburst. *A. G. Michalitsianos, S. P. Maran, R. J. Oliversen, B. Bopp, E. Kontizas, A. Dapergolas, & M. Kontizas.* 371, 761, 71-A7 (1991)
- MARAR, T. M. K. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- MARASCHI, L. Coordinated X-Ray, Ultraviolet, and Optical Observations of 3C 120. *L. Maraschi, L. Chiappetti, R. Falomo, B. Garilli, M. Malkan, G. Tagliaferri, E. G. Tanzi, & A. Treves.* 368, 138, 24-F9 (1991)
- X-Ray to Infrared Observations of the AM Herculis System E1405-451 (V834 Centauri). *R. M. Sambruna, L. Chiappetti, A. Treves, J. M. Bonnet-Bidaud, P. Bouchet, L. Maraschi, C. Motch, & M. Mouchet.* 374, 744, 108-C10 (1991)
- A Model for the Spectral Variability of BL Lacertae Objects at High Frequencies. *A. Celotti, L. Maraschi, & A. Treves.* 377, 403, 144-G1 (1991)
- Short-Term X-Ray Variability of the BL Lacertae Object PKS 2155-304: Power Spectrum and Cross-Correlation Analysis. *G. Tagliaferri, L. Stella, L. Maraschi, A. Treves, & A. Celotti.* 380, 78, 177-A5 (1991)
- A Two-Phase Model for the X-Ray Emission from Seyfert Galaxies. *F. Haardt & L. Maraschi.* 380, L51, 188-B6 (1991)
- On the Nebulosity Surrounding the BL Lacertae Object PKS 2155-304. *R. Falomo, E. Giraud, L. Maraschi, J. Melnick, E. G. Tanzi, & A. Treves.* 380, L67, 188-D1 (1991)
- MARCONI, M. L. Sulfur-bearing Ions in the Ionosphere of Comet Halley. *M. L. Marconi, D. A. Mendis, D. L. Mitchell, R. P. Lin, A. Korib, & H. Réme.* 378, 756, 161-F7 (1991)
- MARDIROSSIAN, F. The Luminosity-Diameter Relation for Disk Galaxies in Different Environments. *M. Girardi, A. Biviano, G. Giuricin, F. Mardirossian, & M. Mezzetti.* 366, 393, 7-F7 (1991)
- Arm Classification and Velocity Gradients in Spiral Galaxies. *A. Biviano, M. Girardi, G. Giuricin, F. Mardirossian, & M. Mezzetti.* 376, 458, 132-B7 (1991)
- MARGON, BRUCE. Faint Object Camera Observations of a Globular Cluster Nova Field. *Bruce Margon, Scott F. Anderson, Ronald A. Downes, Ralph C. Bohlin, & Peter Jakobsen.* 369, L71, 46-C1 (1991)
- See BEAVER, E. A., et al. Far-Ultraviolet Spectroscopy of the Quasar UM 675 with the Faint Object Spectrograph on the *Hubble Space Telescope.*
- Three Newly Recognized Dwarf Carbon Stars. *Paul J. Green, Bruce Margon, & D. Jack MacConnell.* 380, L31, 181-E1 (1991)
- MARiska, J. T. Nonequilibrium Ionization Effects in Asymmetrically Heated Loops. *D. Spadaro, S. K. Antiochos, & J. T. Mariska.* 382, 338, 204-D1 (1991)
- MARiska, JOHN T. Numerical Simulations of Microflare Evolution in the Solar Transition Region and Corona. *Alphonse C. Sterling, John T. Mariska, Kazunari Shibata, & Yoshinori Suematsu.* 381, 313, 192-G8 (1991)
- Soft X-Ray Emission from Electron-Beam-heated Solar Flares. *John T. Mariska & Dominic M. Zarro.* 381, 572, 197-F10 (1991)
- MARKEVITCH, M. Do Clusters of Galaxies Affect the Spectrum of the Microwave Background? *M. Markevitch, G. R. Blumenthal, W. Forman, C. Jones, & R. A. Sunyaev.* 378, L33, 162-D1 (1991)
- MARKWORTH, N. L. Simultaneous Light and Radial Velocity Curve Solutions for U Cephei. *J. B. Rafert & N. L. Markworth.* 377, 278, 141-D5 (1991)
- MARLBOROUGH, J. M. Continuum Polarization by Electron Scattering in Rotationally Distorted, Radiation-driven Stellar Winds: B[e] Supergiants. *Cameron J. Boyd & J. M. Marlborough.* 369, 191, 38-C11 (1991)
- MARSCHER, ALAN P. Multifrequency VLA, VLBI, and Single-Dish Observations of the Quasar 4C 39.25. *Alan P. Marscher, Yun Fei Zhang, David B. Shaffer, Hugh D. Aller, & Margo F. Aller.* 371, 491, 67-E12 (1991)
- Detection of Local Interstellar CO Absorption toward BL Lacertae. *Alan P. Marscher, Thomas M. Bania, & Zhong Wang.* 371, L77, 73-D7 (1991)
- MARSH, T. R. Evidence for CNO Processed Material in the Accretion Disk of GP Comae. *T. R. Marsh, Keith Horne, & Simon Rosen.* 366, 535, 9-F1 (1991)
- MARSH, THOMAS R. IUE Spectra of the Eclipsing Binary NN Serpentis. *Janet H. Wood & Thomas R. Marsh.* 381, 551, 197-E1 (1991)
- MARSHALL, F. E. Small-Scale Fluctuations and Angular Correlations of the X-Ray Background in the HEAO 1 A-2 Energy Band: Constraints on Clustering of X-Ray Sources. *J. M. Martin-Mirones, G. De Zotti, E. A. Boldt, F. E. Marshall, L. Danese, A. Franceschini, & M. Persic.* 379, 507, 171-A4 (1991)
- MARTEL, HUGO. N-Body Simulation of Large-Scale Structures in  $\Lambda \neq 0$  Friedmann Models. *Hugo Martel.* 366, 353, 7-C1 (1991)
- Second-Order Perturbation Theory in  $\Omega \neq 1$  Friedmann Models. *Hugo Martel & Wolfram Freudling.* 371, 1, 60-B1 (1991)
- Linear Perturbation Theory and Spherical Overdensities in  $\Lambda \neq 0$  Friedmann Models. *Hugo Martel.* 377, 7, 138-B7 (1991)
- The Peculiar Velocity Field in the Hercules Region. *Wolfram Freudling, Hugo Martel, & Martha P. Haynes.* 377, 349, 144-B12 (1991)
- Fragmentation of Elongated Cylindrical Clouds. III. Formation of Binary and Multiple Systems. *Ian Bonnell, Hugo Martel, Pierre Bastien, Jean-Pierre Arcoragi, & Willy Benz.* 377, 553, 146-E5 (1991)
- Fragmentation of Elongated Cylindrical Clouds. I. Isothermal Clouds. *Pierre Bastien, Jean-Pierre Arcoragi, Willy Benz, Ian Bonnell, & Hugo Martel.* 378, 255, 154-B5 (1991)
- Fragmentation of Elongated Cylindrical Clouds. II. Polytropic Clouds. *Jean-Pierre Arcoragi, Ian Bonnell, Hugo Martel, Willy Benz, & Pierre Bastien.* 380, 476, 184-B7 (1991)
- MARTEMYANOV, B. V. Astrophysical Limits for Binding Energy of Strange Matter. *M. I. Krivoruchenko & B. V. Martemyanov.* 378, 628, 160-C1 (1991)
- MARTIN, CHRISTOPHER. The Albedo and Scattering Phase Function of Interstellar Dust and the Diffuse Background at Far-Ultraviolet Wavelengths. *Mark Hurwitz, Stuart Bowyer, & Christopher Martin.* 372, 167, 76-A12 (1991)
- Spectroscopic Limits to an Extragalactic Far-Ultraviolet Background. *Christopher Martin, Mark Hurwitz, & Stuart Bowyer.* 379, 549, 171-D10 (1991)

- MARTIN, P. G. Physical Conditions in the Orion Nebula and an Assessment of Its Helium Abundance. *Jack A. Baldwin, Gary J. Ferland, P. G. Martin, Michael R. Corbin, Stephen A. Cota, Bradley M. Peterson, & Arne Slettebak.* 374, 580, 106-D1 (1991)
- Shape and Clustering Effects on the Optical Properties of Amorphous Carbon. *François Rouleau & P. G. Martin.* 377, 526, 146-C3 (1991)
- Partially Dissociative Jump Shocks in Molecular Hydrogen. *C. A. Chang & P. G. Martin.* 378, 202, 153-E1 (1991)
- MARTIN, PETER G. Neutral Oxygen in Planetary Nebulae: Probing Radiative Transfer and Nebular Structure. *Michael G. Richer, Marshall L. McCall, & Peter G. Martin.* 377, 210, 140-E1 (1991)
- MARTIN, PIERRE. Possible Deflection of a Jet by Molecular Clouds in NGC 4258. *R. L. Plante, K. Y. Lo, Jean-René Roy, Pierre Martin, & Louis Noreau.* 381, 110, 190-D4 (1991)
- MARTIN, ROBERT N. Hot Gas in the Nucleus of M82:  $^{12}\text{CO}$  and  $^{13}\text{CO}$   $J = 3-2$  Observations. *Jean L. Turner, Robert N. Martin, & Paul T. P. Ho.* 367, 677, 21-F6 (1991) (Orig. paper in 351, 418, 45-C5 (1990))
- MARTINIS, L. Diffuse Galactic Emission at Millimetric Wavelengths. *P. Andreani, G. Dall'Olgo, L. Martinis, L. Piccirillo, L. Pizzo, L. Rossi, & C. Venturino.* 375, 148, 112-G5 (1991)
- MARTIN-MIRONES, J. M. Small-Scale Fluctuations and Angular Correlations of the X-Ray Background in the HEAO 1 A-2 Energy Band: Constraints on Clustering of X-Ray Sources. *J. M. Martin-Mirones, G. De Zotti, E. A. Boldt, F. E. Marshall, L. Danese, A. Franceschini, & M. Persic.* 379, 507, 171-A4 (1991)
- MARZIANI, P. The Effect of Anisotropic Emission from Thick Accretion Disks on the Luminosity Functions of Active Galactic Nuclei. *C. M. Urry, P. Marziani, & M. Calvani.* 371, 510, 67-G7 (1991)
- MASI, S. High-Latitude Galactic Emission and the Search for Anisotropies of the Cosmic Background Radiation. *S. Masi, P. de Bernardis, M. De Petris, M. Epifani, M. Gervasi, & G. Guarini.* 366, L51, 11-B1 (1991)
- MASI, SILVIA. Cosmic Microwave Background and Galactic Quadrupoles in the Millimeter Region. *Paolo de Bernardis, Silvia Masi, & Nicola Vittorio.* 382, 515, 208-A1 (1991)
- MASNOU, J. L. See MASSARO, E., et al. Detection of a Feature at 0.44 MeV in the Crab Pulsar Spectrum with FIGARO II: A Redshifted Positron Annihilation Line?
- MASON, G. M. See ADAMS, J. H., Jr., et al. The Charge State of the Anomalous Component of Cosmic Rays.
- MASON, H. E. A Critical Assessment of Electron Excitation between the  $2s^22p^2$  and  $2s2p^3$  Configurations of Mg $^{+6}$ . *A. Burgess, H. E. Mason, & J. A. Tully.* 376, 803, 136-D1 (1991)
- MASON, K. O. See GIOMMI, P., et al. The EXOSAT High Galactic Latitude Survey.
- MASSA, DERCK. Ultraviolet Interstellar Absorption toward HD 156359, a Halo Star at 11 Kiloparsecs in the Direction  $l = 329^\circ$  and  $b = -15^\circ$ . *Kenneth R. Sembach, Blair D. Savage, & Derck Massa.* 372, 81, 75-A11 (1991)
- MASSAGLIA, S. The Finite-Amplitude Behavior of the Joule Mode under Astrophysical Conditions. *G. Bodo, S. Massaglia, R. Rosner, & A. Ferrari.* 370, 398, 52-C1 (1991)
- MASSARO, E. Detection of a Feature at 0.44 MeV in the Crab Pulsar Spectrum with FIGARO II: A Redshifted Positron Annihilation Line? *E. Massaro, G. Matti, M. Salvati, E. Costa, P. Mandrou, M. Niel, J. F. Olive, T. Mineo, B. Sacco, L. Scarsi, G. Gerardi, B. Aginier, E. Barouch, R. Comte, B. Parlier, & J. L. Masnon.* 376, L11, 130-B7 (1991)
- MASSON, COLIN R. A Nearly Unipolar CO Outflow from the HH 46-47 System. *Lawrence M. Chernin & Colin R. Masson.* 382, L93, 211-E3 (1991)
- MASTICHIADIS, A. Cosmic-Ray Transport and Gamma-Ray Emission in Supernova Shells. *A. K. Harding, A. Mastichiadis, R. J. Protheroe, & A. P. Szabo.* 378, 163, 153-A9 (1991)
- MATEO, MARIO. Near-Infrared Time-resolved Spectroscopy of the Cataclysmic Variable YY Draconis. *Mario Mateo, Paula Szkody, & Peter Garnavich.* 370, 370, 51-G8 (1991)
- MATHER, J. C. See SMOOT, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a  $7^\circ$  Beam by the *Cosmic Background Explorer* (COBE).
- MATHEWS, G. J. Inhomogeneous Halo Collapse and Early Galactic Chemical Evolution: Globular Cluster Metallicities. *G. Malinie, D. H. Hartmann, & G. J. Mathews.* 376, 520, 132-G9 (1991)
- MATHEWS, WILLIAM G. Hot Gas Metallicity and the History of Supernova Activity in Elliptical Galaxies. *Michael Loewenstein & William G. Mathews.* 373, 445, 93-D11 (1991)
- Multidirectional Views of the Active Nucleus of NGC 1068. *J. S. Miller, R. W. Goodrich, & William G. Mathews.* 378, 47, 151-E13 (1991)
- MATHEZ, GUY. Spectroscopy of the Gravitational Arcs in Cl 2244-02, A370 (Arclet A5), and Cl 0024+1654. *Yannick Mellier, Bernard Fort, Geneviève Soucail, Guy Mathez, & Mireille Cailloux.* 380, 334, 182-D10 (1991)
- MATHIS, DOUG F. See WINDHORST, ROGIER A., et al. The Discovery of a Young Radio Galaxy at  $z = 2.390$ : Probing Initial Star Formation at  $z \lesssim 3.0$ .
- MATHIS, JOHN S. X-Ray Halos as Diagnostics of Interstellar Grains. *John S. Mathis & C.-W. Lee.* 376, 490, 132-E1 (1991)
- MATSAKIS, D. N. Daily Observations of Compact Radio Sources at 2.7 and 8.1 GHz: 1979-1987. *E. B. Waltman, R. L. Fiedler, K. J. Johnston, J. H. Spencer, D. R. Florkowski, F. J. Josties, D. D. McCarthy, & D. N. Matsakis.* 77, 379, 49-G5 (1991)
- MATSUDA, TAKUYA. Rayleigh-Taylor Instabilities and Mixing in the Helium Star Models for Type Ib/c Supernovae. *Izumi Hachisu, Takuya Matsuda, Ken'ichi Nomoto, & Toshikazu Shigeyama.* 368, L27, 35-B4 (1991)
- MATSUHARA, HIDEO. See SHIBAI, HIROSHI, et al. Large-Scale [C II] 158 Micron Emission from the Galaxy.
- MATSUI, YUTAKA. W28 and 3C 400.2: Two Shell-like Radio Supernova Remnants with Centrally Peaked X-Ray Morphologies. *Knox S. Long, William P. Blair, Richard L. White, & Yutaka Matsui.* 373, 567, 95-A10 (1991)
- MATSUMOTO, T. See KOYAMA, K., et al. An X-Ray Pulsator in the Direction of Molecular Cloud MBM 12 (Lynds 1457).
- MATSUOKA, M. See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- MATSUSHIMA, FUSAKAZU. Atomic Oxygen Fine-Structure Splittings with Tunable Far-Infrared Spectroscopy. *Lyndon R. Zink, Kenneth M. Evenson, Fusakazu Matsushima, Thomas Nelis, & Ruth L. Robinson.* 371, L85, 73-E3 (1991)
- MATT, G. See MASSARO, E., et al. Detection of a Feature at 0.44 MeV in the Crab Pulsar Spectrum with FIGARO II: A Redshifted Positron Annihilation Line?
- X-Ray Observations of the Seyfert 1 Galaxy Markarian 464. *L. Piro, G. Matti, E. Costa, D. Dal Fiume, F. Frontera, & E. Morelli.* 380, 357, 182-F9 (1991)
- MATTEI, JANET A. The Interoutburst Behavior of Cataclysmic Variables. *Paula Szkody, Janet A. Mattei, Elizabeth O. Waagen, & Clay Stahle.* 76, 359, 29-E1 (1991)
- MATTEUCCI, F. Abundance Gradients and Galaxy Formation. *M. Stiavelli & F. Matteucci.* 377, L79, 150-C9 (1991)
- MATTHEWS, ALEX. Reconstructing the Primordial Spectrum of Fluctuations of the Universe from the Observed Nonlinear Clustering of Galaxies. *A. J. S. Hamilton, P. Kumar, Edward Lu, & Alex Matthews.* 374, L1, 103-B7 (1991)
- MATTHEWS, J. Search for Diffuse Cosmic Gamma Rays above 200 TeV. *J. Matthews, D. Ciampa, K. D. Green, J. Kolodziejczak, D. Nitz, D. Sinclair, G. Thornton, J. C. van der Velde, G. L. Cassiday, R. Cooper, S. C. Corbato, B. R. Dawson, J. W. Elbert, B. E. Fick, D. B. Kieda, S. Ko, D. F. Liebing, E. C. Loh, M. H. Salamon, J. D. Smith, P. Sokolsky, S. B. Thomas, & B. Wheeler.* 375, 202, 113-E1 (1991)
- MATTHEWS, K. Discovery of an Infrared Nucleus in Cygnus A: An Obscured Quasar Revealed? *S. Djorgovski, N. Weir, K. Matthews, & J. R. Graham.* 372, L67, 85-C5 (1991)
- See SOIFER, B. T., et al. Near-Infrared Observations of the  $z \sim 2.3$  IRAS Source FSC 10214+4724.
- See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.

- MATTHEWS, KEITH. See WINDHORST, ROGIER A., et al. The Discovery of a Young Radio Galaxy at  $z = 2.390$ : Probing Initial Star Formation at  $z \lesssim 3.0$ .
- MATZNER, RICHARD A. Anisotropies of the Cosmic Background Radiation in a "Hot" Dark Matter Universe. *Peter Anninos, Richard A. Matzner, Robin Tuluie, & Joan Centrella.* 382, 71, 201-A1 (1991)
- MAUAS, P. J. Formation of the Infrared Emission Lines of Mg I in the Solar Atmosphere. *E. S. Chang, E. H. Avrett, P. J. Mauas, R. W. Noyes, & R. Loeser.* 379, L79, 175-E1 (1991)
- MAUCHE, CHRISTOPHER W. On the X-Ray-emitting Boundary Layer of the Dwarf Nova VV Hydri. *Christopher W. Mauche, Richard A. Wade, Ronald S. Polidan, Hans van der Woerd, & Frits B. S. Paerels.* 372, 659, 83-G7 (1991)
- High-Resolution IUE Spectra of the Nova-like Variable IX Velorum. *Christopher W. Mauche.* 373, 624, 95-F7 (1991)
- MAURER, M. J. See KRISHER, T. P., et al. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of *Voyager 2*.
- MAUROGORDATO, SOPHIE. Scaling Invariance in the Galaxy Distribution. II. Spatial and Luminosity Effects. *Sophie Maurogordato & Marc Lachièze-Rey.* 369, 30, 36-D1 (1991)
- MAYOR, M. Two High-Velocity Stars Shot Out from the Core of the Globular Cluster 47 Tucanae. *G. Meylan, P. Dubath, & M. Mayor.* 383, 587, 221-E4 (1991)
- MAYR, H. G. What Maintains the Zonal Circulation in Planetary Atmospheres? *H. G. Mayr, K. L. Chan, I. Harris, & K. Schatten.* 367, 361, 16-E1 (1991)
- MAYR, HANS G. On the Contrast of Facular Hillocks in the Infrared. *Kenneth H. Schatten & Hans G. Mayr.* 372, 728, 84-F7 (1991)
- MAZEH, T. See MAOZ, D., et al. High-Rate Active Galaxy Monitoring at the Wise Observatory. III. The Broad-Line Region of NGC 4151.
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- MAZEH, TSEVI. On the Orbital Circularization of Close Binaries. *Izthak Goldman & Tsvi Mazeh.* 376, 260, 128-B8 (1991)
- MAZZARELLA, J. M. See SOIFER, B. T., et al. Near-Infrared Observations of the  $z \sim 2.3$  IRAS Source FSC 10214+4724.
- MAZZITELLI, I. Stellar Turbulent Convection: A New Model and Applications. *V.M. Canuto & I. Mazzitelli.* 370, 295, 51-A1 (1991)
- MCARTHUR, B. See FRANZ, O. G., et al. Binary Star Observations with the *Hubble Space Telescope* Fine Guidance Sensors. I. ADS 11300.
- MC CALL, MARSHALL L. Neutral Oxygen in Planetary Nebulae: Probing Radiative Transfer and Nebular Structure. *Michael G. Richer, Marshall L. McCall, & Peter G. Martin.* 377, 210, 140-E1 (1991)
- MC CORMAN, D. Limits on the Density of Neutral Gas within 100 Parsecs from Observations of the Soft X-Ray Background. *M. Juda, J. J. Bloch, B. C. Edwards, D. McCorman, W. T. Sanders, S. L. Snowden, & J. Zhang.* 367, 182, 14-C8 (1991)
- MCCANN, S. M. Fe XII Line Ratios in Solar Flares. *S. S. Tayal, Ronald J. W. Henry, E. P. Keenan, S. M. McCann, & K. G. Widner.* 369, 567, 44-G1 (1991)
- MCCARTHY, D. D. Daily Observations of Compact Radio Sources at 2.7 and 8.1 GHz: 1979-1987. *E. B. Waltman, R. L. Fiedler, K. J. Johnston, J. H. Spencer, D. R. Florkowski, F. J. Josties, D. D. McCarthy, & D. N. Matsakis.* 77, 379, 49-G5 (1991)
- MCCARTHY, DONALD W., JR. A Standard Stellar Spectral Sequence in the Red/Near-Infrared: Classes K5 to M9. *J. Davy Kirkpatrick, Todd J. Henry, & Donald W. McCarthy, Jr.* 77, 417, 50-C5 (1991)
- MCCARTHY, JAMES K. Echelle Spectroscopy of CD  $-41^\circ$  13967: The Young Central Star of a New Planetary Nebula. *James K. McCarthy, R. Michael Rich, S. R. Becker, K. Butler, D. Husfeld, & H. G. Groth.* 371, 380, 64-G1 (1991)
- Radial Velocities of 26 Northern Milky Way Cepheids. *Mark R. Metzger, John A. R. Caldwell, James K. McCarthy, & Paul L. Schechter.* 76, 803, 35-G3 (1991)
- MCCARTHY, PATRICK J. Correlated Radio and Optical Asymmetries in Powerful Radio Sources. *Patrick J. McCarthy, Wil van Breugel, & Vijay K. Kapahi.* 371, 478, 67-D11 (1991)
- MCCARTNEY, J. E. See FRANZ, O. G., et al. Binary Star Observations with the *Hubble Space Telescope* Fine Guidance Sensors. I. ADS 11300.
- MCCAUGHRAN, MARK. Polarimetric Imaging of the Galactic Center at 12.4 Microns: The Detailed Magnetic Field Structure in the Northern Arm and East-West Bar. *David K. Aitken, Daniel Gezari, Craig H. Smith, Mark McCaughran, & Patrick F. Roche.* 380, 419, 183-D10 (1991)
- MCLINTOCK, J. E. The *Einstein* Objective Grating Spectrometer Survey of Galactic Binary X-Ray Sources. *S. D. Vrtilek, J. E. McClintock, F. D. Seward, S. M. Kahn, & B. J. Wargelin.* 76, 1127, 41-C1 (1991)
- MCLINTOCK, JEFFREY E. Galaxy Evolution in Distant, X-Ray-Selected Clusters of Galaxies. I. Cl 1358+6245. *Daniel G. Fabricant, Jeffrey E. McClintock, & Marshall W. Bautz.* 381, 33, 189-DB (1991)
- MCLURE, ROBERT D. Supernova Rates and Galaxy Inclinations: Erratum. *Sidney van den Berg & Robert D. McClure.* 371, 443, 65-F3 (1991) (Orig. paper in 359, 277, 139-D13 (1990))
- MCCUSKEY, CAROLINA PACIENCIA SALAS. IUE Investigation of Mass Flow in the Interacting Binary U Sagittae. *George E. McCluskey, Jr., Carolina Paciencia Salas McCluskey, & Yoji Kondo.* 378, 281, 154-D9 (1991)
- MCCUSKEY, GEORGE E., JR. IUE Investigation of Mass Flow in the Interacting Binary U Sagittae. *George E. McCluskey, Jr., Carolina Paciencia Salas McCluskey, & Yoji Kondo.* 378, 281, 154-D9 (1991)
- MCCLYMONT, A. N. Dynamic Magnetic Reconnection at an X-Type Neutral Point. *I. J. D. Craig & A. N. McClymont.* 371, L41, 66-F1 (1991)
- MCCLYMONT, ALEXANDER N. The Stretching of Magnetic Flux Tubes in the Convective Overshoot Region. *George H. Fisher, Alexander N. McClymont, & Dean-Yi Chou.* 374, 766, 108-E10 (1991)
- MCCOOK, GEORGE P. Interpreting Epsilon Aurigae. *Sean M. Carroll, Edward F. Guinan, George P. McCook, & Robert A. Donahue.* 367, 278, 15-E1 (1991)
- MCCRAY, RICHARD. Comptonization of Gamma Rays by Cold Electrons. *Yueming Xu, Randy R. Ross, & Richard McCray.* 371, 280, 63-E11 (1991)
- Supernova Remnant 1987A. *Ding Luo & Richard McCray.* 372, 194, 76-D1 (1991)
- Energy Degradation of Fast Electrons in Hydrogen Gas. *Yueming Xu & Richard McCray.* 375, 190, 113-D1 (1991)
- The Circumstellar Shell of SN 1987A. *Ding Luo & Richard McCray.* 379, 659, 172-G9 (1991)
- MCCUTCHEON, W. H. IRAS 23545+6508, a Dissociating Star: Prototype for a New Observational Class? *P. E. Dewdney, R. S. Roger, C. R. Purton, & W. H. McCutcheon.* 370, 243, 50-C1 (1991)
- MCDOWELL, JONATHAN. Persistence and Change in the Soft X-Ray Spectrum of the Quasar PG 1211+143. *Martin Elvis, P. Giommi, Belinda J. Wilkes, & Jonathan McDowell.* 378, 537, 159-B1 (1991)
- MCGAUGH, STACY S. H II Region Abundances: Model Oxygen Line Ratios. *Stacy S. McGaugh.* 380, 140, 177-G1 (1991)
- MCGLYNN, THOMAS A. Angular Momentum and Stripping in Tidal Interactions. *Thomas A. McGlynn & Kirk D. Borne.* 372, 31, 74-D7 (1991)
- MCGONAGLE, D. Nitric Oxide in Star-forming Regions: Further Evidence for Interstellar N-O Bonds. *L. M. Ziurys, D. McGonagle, Y. Minh, & W. M. Irvine.* 373, 535, 94-E11 (1991)
- MCGRAW, JOHN T. An Infrared/Optical Investigation of 100 Micron "Cirrus." *Elizabeth S. Paley, Frank J. Low, John T. McGraw, Roc M. Cutri, & Hans-Walter Rix.* 376, 335, 129-A13 (1991)
- MCGUIRE, R. E. See ADAMS, J. H., JR., et al. The Charge State of the Anomalous Component of Cosmic Rays.
- MCHARDY, I. An X-Ray and Radio Study of Steep-Spectrum Radio Sources. II. Four Fields from a 22 MHz Polar Cap Survey. *P. E. Dewdney, C. H. Costain, I. McHardy, A. G. Willis, D. E. Harris, & C. P. Stern.* 76, 1055, 40-D1 (1991)
- MCKEE, CHRISTOPHER F. Radiative Transfer in Astronomical Masers. III. Filamentary Masers. *Moshe Elitzur, Christopher F. McKee, & David J. Hollenbach.* 367, 333, 16-B10 (1991)
- Unsaturated Comptonization of Isotropic Photon Spectra by Relativistic Electrons. *Abraham Loeb, Christopher F. McKee, & Ofer Lahav.* 374, 44, 98-E5 (1991)

- Isothermal, Compton-heated Coronae above Accretion Disks. *Eve C. Ostriker, Christopher F. McKee, & Richard J. Klein.* 377, 593, 147-B3 (1991)
- MCLEAN, A. D. Is Interstellar Detection of Higher Members of the Linear Radicals  $C_nCH$  and  $C_nN$  Feasible? *F. Pauzat, Y. Ellinger, & A. D. McLean.* 369, L13, 40-B11 (1991)
- MCLEAN, I. S. Infrared Emission Regions in the Interacting Galaxy System Arp 299. *C. G. Wynn-Williams, S. A. Eales, E. E. Becklin, K.-W. Hodapp, R. D. Joseph, I. S. McLean, D. A. Simons, & G. S. Wright.* 377, 426, 145-A13 (1991)
- MCMAHAN, ROBERT K., JR. Gravitational Redshift for the Pleiad White Dwarf LB 1497. *Gary Wegner, I. Neill Reid, & Robert K. McMahan, Jr.* 376, 186, 127-C6 (1991)
- MCMAHON, R. See SOIFER, B. T., et al. Near-Infrared Observations of the  $z \sim 2.3$  *IRAS* Source FSC 10214+4724.
- MCMAHON, R. G. A Radio-quiet Galaxy at Redshift  $z = 3.409$ . *D. A. Turnshek, F. Macchetto, M. V. Bencke, C. Hazard, W. B. Sparks, & R. G. McMahon.* 382, 26, 200-D1 (1991)
- MCMAHON, RICHARD G. A New Spectroscopic Survey for Damped Ly $\alpha$  Absorption Lines from High-Redshift Galaxies. *Kenneth M. Lanzetta, Arthur M. Wolfe, David A. Turnshek, Limin Lu, Richard G. McMahon, & Cyril Hazard.* 77, 1, 43-B1 (1991)
- MCMILLAN, STEVE. Star Cluster Evolution with Primordial Binaries. II. Detailed Analysis. *Steve McMillan, Piet Hut, & Junichiro Makino.* 372, 111, 75-D5 (1991)
- MCTIERNAN, JAMES M. Center-to-Limb Variations of Characteristics of Solar Flare Hard X-Ray and Gamma-Ray Emission. *James M. McTiernan & Vahé Petrosian.* 379, 381, 167-F11 (1991)
- MEADE, M. R. See TAYLOR, M., et al. First Ultraviolet Spectropolarimetry of Hot Supergiants. See BJORKMAN, K. S., et al. First Ultraviolet Spectropolarimetry of Be Stars from the Wisconsin Ultraviolet Photo-Polarimeter Experiment.
- MEATHERINGHAM, S. J. Photoionization Modeling of Magellanic Cloud Planetary Nebulae. I. *M. A. Dopita & S. J. Meatheringham.* 367, 115, 13-D6 (1991)
- LMC SMP 64: The Youngest Planetary Nebula? *M. A. Dopita & S. J. Meatheringham.* 374, L21, 103-E1 (1991)
- Photoionization Modeling of Magellanic Cloud Planetary Nebulae. II. *M. A. Dopita & S. J. Meatheringham.* 377, 480, 145-F6 (1991)
- MEATHERINGHAM, STEPHEN J. Optical Spectroscopy of Magellanic Cloud Planetary Nebulae. I. *Stephen J. Meatheringham & Michael A. Dopita.* 75, 407, 6-C9 (1991)
- Optical Spectroscopy of Magellanic Cloud Planetary Nebulae. II. *Stephen J. Meatheringham & Michael A. Dopita.* 76, 1085, 40-F7 (1991)
- MEDIAVILLA, E. An Optical Fiber System to Perform Bidimensional Spectroscopy. *S. Arribas, E. Mediavilla, & J. L. Rasilla.* 369, 260, 39-B9 (1991)
- MEIER, DAVID L. Heavy, Overpressured Jets and the Radio Source Hercules A. *David L. Meier, Alberto C. Sadun, & Kevin R. Lind.* 379, 141, 164-F9 (1991)
- MEIER, R. R. Analysis of the Solar O II/O III Multiplets at 834 Å: Implications for the Emission Measure Distribution in the Vicinity of 40,000 K. *R. R. Meier, K. G. Widing, & U. Feldman.* 369, 570, 44-G7 (1991)
- MEIKIN, AVERY. Southern Sky Redshift Survey: The Catalog. *L. Nicolaci da Costa, Paulo S. Pellegrini, Marc Davis, Avery Meiksin, Wallace L. W. Sargent, & John L. Tonry.* 75, 935, 15-B1 (1991)
- The Hydrodynamics of Relict Cosmological H II Regions and the Formation of Objects at High Redshift. *Piero Madau & Avery Meiksin.* 374, 6, 98-B7 (1991)
- MEINHOLD, PETER. A Medium-Scale Measurement of the Cosmic Microwave Background at 3.3 Millimeters. *Peter Meinhold & Philip Lubin.* 370, L11, 53-C1 (1991)
- Limits on Cold Dark Matter Cosmologies from New Anisotropy Bounds on the Cosmic Microwave Background. *Nicola Vittorio, Peter Meinhold, Pio Francesco Muciaccia, Philip Lubin, & Joseph Silk.* 372, L1, 79-A7 (1991)
- MEIXNER, MARGARET. High Angular Resolution Broad-Band Imaging in the Mid-Infrared: The Infrared-bright Galaxy NGC 34. *Eric Keto, Garrett Jernigan, Roger Ball, John Arens, & Margaret Meixner.* 374, L29, 110-B1 (1991)
- MELIA, FULVIO. Transverse Conductivity of a Relativistic Plasma in Oblique Electric and Magnetic Fields. *Fulvio Melia & Marco Fatuzzo.* 373, 198, 88-D8 (1991)
- Flux-limited Diffusion in a Scattering Medium. *Fulvio Melia & Gregory J. Zylstra.* 374, 732, 108-B9 (1991)
- Transient Particle Acceleration in Strongly Magnetized Neutron Stars. *Fulvio Melia & Marco Fatuzzo.* 376, 673, 134-F7 (1991)
- Radiative-hydrodynamical Simulations of Accretion Disk Coronae. *Fulvio Melia, Gregory J. Zylstra, & Bruce Fryxell.* 377, L101, 150-E11 (1991)
- Transient Particle Acceleration in Strongly Magnetized Neutron Stars. II. Effects Due to a Dipole Field Geometry. *Marco Fatuzzo & Fulvio Melia.* 382, 570, 208-E10 (1991)
- Gamma-Ray Bursts from Sheared Alfvén Waves. *Fulvio Melia & Marco Fatuzzo.* 383, L57, 226-D1 (1991)
- MELLIER, YANNICK. A Straight Gravitational Image in Abell 2390: A Striking Case of Lensing by a Cluster of Galaxies. *Roser Pelló, Jean-François Le Borgne, Geneviève Soucail, Yannick Mellier, & Blai Sanahuja.* 366, 405, 7-G9 (1991)
- Spectroscopy of the Gravitational Arcs in Cl 2244-02, A370 (Arclet A5), and Cl 0024+1654. *Yannick Mellier, Bernard Fort, Geneviève Soucail, Guy Mathez, & Mireille Cailloux.* 380, 334, 182-D10 (1991)
- MELNICK, GARY J. Excitation of Millimeter and Submillimeter Water Masers. *David A. Neufeld & Gary J. Melnick.* 368, 215, 25-F11 (1991)
- Excitation of Millimeter and Submillimeter Water Masers: Erratum. *David A. Neufeld & Gary J. Melnick.* 374, 784, 108-G4 (1991) (Orig. paper in 368, 215, 25-F11 (1991))
- 321 GHz Submillimeter Water Masers around Evolved Stars. *Karl M. Menten & Gary J. Melnick.* 377, 647, 147-F8 (1991)
- MELNICK, J. On the Nebulosity Surrounding the BL Lacertae Object PKS 2155-304. *R. Falomo, E. Giraud, L. Maraschi, J. Melnick, E. G. Tanzi, & A. Treves.* 380, L67, 188-D1 (1991)
- MELOTT, ADRIAN L. Comparison of Likely Candidate Models for Abell Cluster Structures against the Observed Distribution. *David J. Batuski, Adrian L. Melott, Robert J. Scherrer, & Edmund Bertschinger.* 367, 393, 18-C11 (1991)
- Gravitational Clustering in the Expanding Universe: Controlled High-Resolution Studies in Two Dimensions. *John Francis Beacom, Kurt G. Dominik, Adrian L. Melott, Sam P. Perkins, & Sergei F. Shandarin.* 372, 351, 80-B7 (1991)
- A Quantitative Measure of Phase Correlations in Density Fields. *Robert J. Scherrer, Adrian L. Melott, & Sergei F. Shandarin.* 377, 29, 138-D5 (1991)
- MELROSE, D. B. Emission at Cyclotron Harmonics Due to Coalescence of z-Mode Waves. *D. B. Melrose.* 380, 256, 179-C1 (1991)
- Neutralized and Unneutralized Current Patterns in the Solar Corona. *D. B. Melrose.* 381, 306, 192-F13 (1991)
- MENA-WERTH, JOSÉ. Heating Mechanism(s) for Transition Layers in Giants. *Erika Böhm-Vitense & Jost Mena-Werth.* 378, 718, 161-C8 (1991)
- MENCI, N. The Merging Runaway. *A. Cavaliere, S. Colafrancesco, & N. Menchi.* 376, L37, 137-B10 (1991)
- MENDELL, GREGORY. Superfluid Hydrodynamics in Rotating Neutron Stars. I. Nondissipative Equations. *Gregory Mendell.* 380, 515, 184-F1 (1991)
- Superfluid Hydrodynamics in Rotating Neutron Stars. II. Dissipative Effects. *Gregory Mendell.* 380, 530, 184-G3 (1991)
- MENDELSON, H. See MAOZ, D., et al. High-Rate Active Galaxy Monitoring at the Wise Observatory. III. The Broad-Line Region of NGC 4151.
- MENDIS, D. A. Sulfur-bearing Ions in the Ionosphere of Comet Halley. *M. L. Marconi, D. A. Mendis, D. L. Mitchell, R. P. Lin, A. Korth, & H. Reme.* 378, 756, 161-F7 (1991)
- MENON, M. G. K. See ADARKAR, H., et al. Search for High-Energy Neutrinos from Celestial Sources in the Kolar Gold Fields Experiment.
- MENON, T. K. The Influence of High-Density Environment on the Radio-Far-Infrared Correlation of Spiral Galaxies. *T. K. Menon.* 372, 419, 81-A7 (1991)
- MENTEN, KARL M. VLBI Observations of Interstellar Ammonia Masers. *Preethi Pratap, Karl M. Menten, Mark J. Reid, James M. Moran, & C. Malcolm Walmsley.* 373, L13, 91-B12 (1991)

- 321 GHz Submillimeter Water Masers around Evolved Stars. *Karl M. Menten & Gary J. Melnick.* 377, 647, 147-F8 (1991)
- The Discovery of a New, Very Strong, and Widespread Interstellar Methanol Maser Line. *Karl M. Menten.* 380, L75, 188-E1 (1991)
- MERCHANT, A. C. Barrier Penetration at Astrophysical Energies. *N. Rowley & A. C. Merchant.* 381, 591, 198-B1 (1991)
- MEREGHETTI, S. See BARRET, D., et al. Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2.
- MERRILL, K. M. Infrared Images of M17. *Charles J. Lada, D. L. DePoy, K. M. Merrill, & Ian Gatley.* 374, 533, 105-G1 (1991)
- MERRITT, DAVID. Stability of Nonrotating Stellar Systems. II. Prolate Shell-Orbit Models. *David Merritt & Lars Hernquist.* 376, 439, 131-G13 (1991)
- MERRYFIELD, WILLIAM J. Nonlinear Behavior of Solar Gravity Modes Driven by  $^3\text{He}$  in the Core. II. Numerical Simulations. *William J. Merryfield, Juri Toomre, & Douglas Gough.* 367, 658, 21-D8 (1991)
- Simulation of Effects of Atmospheric Seeing on the Observation of High-Degree Solar Oscillations. *Frank Hill, Douglas Gough, William J. Merryfield, & Juri Toomre.* 369, 237, 38-G7 (1991)
- MÉSZÁROS, P. Dynamic Effects on Cyclotron Scattering in Pulsar Accretion Columns. *J. J. Brainerd & P. Mészáros.* 369, 179, 38-B11 (1991)
- Dust from Early Galaxies and the X-Ray Background Radiation. *B. Rudak & P. Mészáros.* 371, 29, 60-D5 (1991)
- Magnetic Two-Photon Scattering and Two-Photon Emission: Cross Sections and Redistribution Functions. *S. G. Alexander & P. Mészáros.* 372, 554, 82-E11 (1991)
- Cyclotron Harmonics in Accreting Pulsars and Gamma-Ray Bursters: Effect of Two-Photon Processes. *S. G. Alexander & P. Mészáros.* 372, 565, 82-F9 (1991)
- Radiative Widths and Splitting of Cyclotron Lines in Superstrong Magnetic Fields. *G. G. Pavlov, V. G. Bezhastanov, P. Mészáros, & S. G. Alexander.* 380, 541, 185-A1 (1991)
- Spectral Signatures of the MeV-PeV Radiation from Accreting Neutron Stars. *B. Rudak & P. Mészáros.* 383, 269, 215-E3 (1991)
- METZGER, MARK R. Radial Velocities of 26 Northern Milky Way Cepheids. *Mark R. Metzger, John A. R. Caldwell, James K. McCarthy, & Paul L. Schechter.* 76, 803, 35-G3 (1991)
- MEWALDT, R. A. Heliospheric Effects on Cosmic-Ray Electrons. *H. Moraal, J. R. Jokipii, & R. A. Mewaldt.* 367, 191, 14-D8 (1991)
- See ADAMS, J. H., JR., et al. The Charge State of the Anomalous Component of Cosmic Rays.
- The  $^{54}\text{Mn}$  Clock and Its Implications for Cosmic-Ray Propagation and Fe Isotope Studies. *E. J. Grove, B. T. Hayes, R. A. Mewaldt, & W. R. Webber.* 377, 680, 148-B3 (1991)
- MEYER, BRADLEY S. A New Site for the Astrophysical Gamma-Process. *W. Michael Howard, Bradley S. Meyer, & S. E. Woosley.* 373, L5, 91-B1 (1991)
- High-Temperature Neutrino-Nucleus Processes in Stellar Collapse. *George M. Fuller & Bradley S. Meyer.* 376, 701, 135-A12 (1991)
- MEYER, D. I. See AKERLOF, C. W., et al. Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy.
- MEYER, DAVID M. Discovery of Interstellar NH. *David M. Meyer & Katherine C. Roth.* 376, L49, 137-D1 (1991)
- Observations of Ca II Absorption along the Nearly Parallel Lines of Sight toward 3C 273 and SN 1991T. *David M. Meyer & Katherine C. Roth.* 383, L41, 226-B11 (1991)
- MEYER, PETER. Solar Modulation of Cosmic Electrons: Evidence for Dynamical Regulation. *Evelyn Tuska, Paul Evenson, & Peter Meyer.* 373, L27, 91-D1 (1991)
- Energy Spectra and Composition of Primary Cosmic Rays. *Dietrich Müller, Simon P. Swordy, Peter Meyer, Jacques L'Heureux, & John M. Grunsfeld.* 374, 356, 102-E1 (1991)
- MEYER, S. See SMOOT, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- MEYER, S. S. See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a 7° Beam by the Cosmic Background Explorer (COBE).
- MEYER, STEPHAN S. A Measurement of the Large-Scale Cosmic Microwave Background Anisotropy at 1.8 Millimeter Wavelength. *Stephan S. Meyer, Edward S. Cheng, & Lyman A. Page.* 371, L7, 66-B3 (1991)
- MEYERS, KARIE A. The Appearance of a New Redshift System in Markarian 231. *Todd A. Boroson, Karie A. Meyers, Simon L. Morris, & S. E. Persson.* 370, L19, 53-D1 (1991)
- MEYERS-RICE, BARRY A. The Structure and Kinematics of Bipolar Outflows: Observations and Models of the Monoceros R2 Outflow. *Barry A. Meyers-Rice & Charles J. Lada.* 368, 445, 30-E10 (1991)
- MEYLAN, G. Two High-Velocity Stars Shot Out from the Core of the Globular Cluster 47 Tucanae. *G. Meylan, P. Dubath, & M. Mayor.* 383, 587, 221-E4 (1991)
- MEZZETTI, M. The Luminosity-Diameter Relation for Disk Galaxies in Different Environments. *M. Girardi, A. Biviano, G. Giuricin, F. Mardirossian, & M. Mezzetti.* 366, 393, 7-F7 (1991)
- Arm Classification and Velocity Gradients in Spiral Galaxies. *A. Biviano, M. Girardi, G. Giuricin, F. Mardirossian, & M. Mezzetti.* 376, 458, 132-B7 (1991)
- MICELA, G. The Diffuse Soft X-Ray Background As Seen with the Einstein Observatory. *G. Micela, F. R. Harnden, Jr., R. Rosner, S. Sciortino, & G. S. Vaiana.* 380, 495, 184-D1 (1991)
- MICHALITSIANOS, A. G. C IV Line Profile Correlations in NGC 4151. *R. P. Fahey, A. G. Michalitsianos, & D. Kazanas.* 371, 136, 61-F9 (1991)
- Observations of the Peculiar Object MWC 560 in Outburst. *A. G. Michalitsianos, S. P. Maran, R. J. Oliversen, B. Bopp, E. Kontizas, A. Dapergolas, & M. Kontizas.* 371, 761, 71-A7 (1991)
- Ultraviolet and Optical Spectroscopy of the R Aquarii Symmetrical Jet. *J. M. Hollis, R. J. Oliversen, M. Kafatos, A. G. Michalitsianos, & R. M. Wagner.* 377, 227, 140-F11 (1991)
- MICHAUD, G. A Crucial Test of the Diffusion Model: 53 Camelopardalis. *J. Babel & G. Michaud.* 366, 560, 10-A5 (1991)
- MICHAUD, GEORGES. Meridional Circulation and Diffusion in A and Early F Stars. *Paul Charbonneau & Georges Michaud.* 370, 693, 57-A10 (1991)
- Diffusion and Mixing of Lithium and Helium in Population II Dwarfs. *Charles R. Proffitt & Georges Michaud.* 371, 584, 68-G1 (1991)
- Gravitational Settling in Solar Models. *Charles R. Proffitt & Georges Michaud.* 380, 238, 179-A5 (1991)
- MICHEL, F. C. Observation of a Pulsar Wind: CCD Polarimetry of the Crab Nebula. *F. C. Michel, P. A. Scowen, R. J. Dufour, & J. J. Hester.* 368, 463, 30-G1 (1991)
- MICHEL, F. CURTIS. Formation of Dense Charged Bunches in Vacuum Gaps. *F. Curtis Michel.* 383, 808, 224-C6 (1991)
- MICHELSON, P. F. See WOOD, K. S., et al. Searches for Millisecond Pulsations in Low-Mass X-Ray Binaries.
- MICKEY, DONALD L. On the Inference of Magnetic Field Vectors from Stokes Profiles. *John T. Jefferies & Donald L. Mickey.* 372, 694, 84-C9 (1991)
- MIDDLEKOOP, FRANS. See DUNCAN, DOUGLAS K., et al. Ca II H and K Measurements Made at Mount Wilson Observatory, 1966-1983.
- MIDDLELITCH, J. The Galactic Center Radio Source Shines below the Compton Limit. *C. R. Gwinn, R. M. Danen, J. Middelitch, L. M. Ozernoy, & T. Kh. Tran.* 381, L43, 199-B7 (1991)
- MIDDLELITCH, JOHN. High-Speed Multicolor Photometry of V834 Centaurus. *John Middelitch, James N. Imamura, Michael T. Wolff, & Thomas Y. Steiman-Cameron.* 382, 315, 204-B1 (1991)
- MIHALAS, DIMITRI. See DUNCAN, DOUGLAS K., et al. Ca II H and K Measurements Made at Mount Wilson Observatory, 1966-1983.
- MIHARA, T. See NAGASE, F., et al. Cyclotron Line Features in the Spectrum of the Transient X-Ray Pulsar X0115+634. Discovery of a Cyclotron Resonance Feature at 30 keV from the Transient X-Ray Pulsar Cepheus X-4. *T. Mihara, K. Makishima, S. Kamiya, T. Ohashi, F. Nagase, Y. Tanaka, & K. Koyama.* 379, L61, 175-C6 (1991)
- MIHOS, J. CHRISTOPHER. A Numerical Study of Star Formation in Interacting Disk Galaxies. *J. Christopher Mihos, Douglas O. Richstone, & Gregory D. Bothun.* 377, 72, 139-A1 (1991)
- MILEY, G. K. See MACCHETTO, F., et al. HST Observations of 3C 66B: A Double-stranded Optical Jet. See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.

- MILEY, GEORGE K.** Spatially Resolved Optical Images of High-Redshift Quasi-stellar Objects. *Timothy M. Heckman, Matthew D. Lehner, Wil van Breugel, & George K. Miley.* 370, 78, 48-A7 (1991)
- Spectroscopy of Spatially Extended Material around High-Redshift Radio-loud Quasars. *Timothy M. Heckman, Matthew D. Lehner, George K. Miley, & Wil van Breugel.* 381, 373, 195-D1 (1991)
- MILGROM, MORDEHAI.** Criticism of Lake's Analysis of the Rotation Curves of Dwarf Spirals. *Mordehai Milgrom.* 367, 490, 19-D11 (1991)
- MILLAR, T. J.** The Formation of Oxygen-containing Organic Molecules in the Orion Compact Ridge. *T. J. Millar, Eric Herbst, & S. B. Charnley.* 369, 147, 37-F11 (1991)
- MILLER, BRUCE N.** Gravity in One Dimension: A Correction for Ensemble Averaging. *Charles J. Reidl, Jr., & Bruce N. Miller.* 371, 260, 63-D1 (1991)
- MILLER, CHRISTOPHER O.** New Ultraviolet Spectroscopic Features Found in Comet Borsoe-Metcalf (1989a). *C. R. O'Dell, Christopher O. Miller, Anita L. Cochran, William D. Cochran, Chei B. Opal, & Edwin S. Barker.* 368, 616, 32-G1 (1991)
- MILLER, GUY S.** Near-critical Spherical Accretion by Neutron Stars: General Relativistic Treatment. *Myeong-Gu Park & Guy S. Miller.* 371, 708, 70-D1 (1991)
- Soft X-Ray Pulses from Neutron Star Glitches. *Kenneth A. Van Riper, Richard I. Epstein, & Guy S. Miller.* 381, L47, 199-C1 (1991)
- MILLER, H. R.** See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- See EDELSON, R. A., et al. Rapid Ultraviolet Variability in the BL Lacertae Object PKS 2155-304.
- MILLER, J. S.** Multidirectional Views of the Active Nucleus of NGC 1068. *J. S. Miller, R. W. Goodrich, & William G. Mathews.* 378, 47, 151-E13 (1991)
- See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- MILLER, JAMES A.** Magnetohydrodynamic Turbulence Dissipation and Stochastic Proton Acceleration in Solar Flares. *James A. Miller.* 376, 342, 129-B11 (1991)
- MILLER, STEVEN.** Infrared Emissions of  $H_3^+$  in the Atmosphere of Jupiter in the 2.1 and 4.0 Micron Region: Erratum. *Steven Miller, Robert D. Joseph, & Jonathan Tennyson.* 367, L37, 17-F1 (1991) (Orig. paper in 360, L55, 156-E1 (1990))
- A Table of Astronomically Important Ro-vibrational Transitions for the  $H_3^+$  Molecular Ion. *Lancelot Kao, Takeshi Oka, Steven Miller, & Jonathan Tennyson.* 77, 317, 48-E1 (1991)
- MILLER, WAYNE F.** Ablation of Silicate Particles in High-Speed Continuum and Transition Flow with Application to the Collection of Interplanetary Dust Particles. *Aaron J. Rulison, Richard C. Flagan, Thomas J. Ahrens, & Wayne F. Miller.* 371, 432, 65-E5 (1991)
- MILLS, A. P., JR.** Search for  $H_2$ -He Alloy Formation at Low Pressures and Cosmic Snowballs. *M. Levenshal & A. P. Mills, Jr.* 368, 178, 25-C7 (1991)
- MILONE, E. F.** Analysis and Solution of the Light and Radial Velocity Curves of the Contact Binary TY Bootis. *E. F. Milone, G. Groisman, D. J. I. Fry, & D. H. Bradstreet.* 370, 677, 56-G5 (1991)
- MINCHIN, N. R.** Molecular Hydrogen Polarization Images of OMC-1. *Michael G. Burton, N. R. Minchin, J. H. Hough, C. Aspin, D. J. Axon, & J. A. Bailey.* 375, 611, 120-C9 (1991)
- MINEO, T.** See MASSARO, E., et al. Detection of a Feature at 0.44 MeV in the Crab Pulsar Spectrum with FIGARO II: A Redshifted Positron Annihilation Line?
- MINESHIGE, SHIN.** Pair-Density Transitions in Accretion Disk Coronae. *Masaaki Kusunose & Shin Mineshige.* 381, 490, 196-G1 (1991)
- MINH, Y.** Nitric Oxide in Star-forming Regions: Further Evidence for Interstellar N-O Bonds. *L. M. Ziurys, D. McGonagle, Y. Minh, & W. M. Irvine.* 373, 535, 94-E11 (1991)
- MIRABEL, I. F.** High-Resolution CO Observations of Luminous Infrared Galaxies with Large  $L_{\text{ir}}/L_B$  Ratios: IRAS 10173+0828, Zw 049.057, IRAS 17208-0014. *P. Planesas, I. F. Mirabel, & D. B. Sanders.* 370, 172, 49-C5 (1991)
- MIRALDA-ESCUDE, JORDI.** Gravitational Lensing by Clusters of Galaxies: Constraining the Mass Distribution. *Jordi Miralda-Escudé.* 370, 1, 47-B1 (1991)
- The Magnification of Stars Crossing a Caustic. I. Lenses with Smooth Potentials. *Jordi Miralda-Escudé.* 379, 94, 164-B7 (1991)
- The Correlation Function of Galaxy Ellipticities Produced by Gravitational Lensing. *Jordi Miralda-Escudé.* 380, 1, 176-B1 (1991)
- MISCH, ANTHONY.** See DUNCAN, DOUGLAS K., et al. Ca II H and K Measurements Made at Mount Wilson Observatory, 1966-1983.
- MISHchenko, MIKHAIL I.** Extinction and Polarization of Transmitted Light by Partially Aligned Nonspherical Grains. *Mikhail I. Mishchenko.* 367, 561, 20-C8 (1991)
- MITCHELL, D. L.** Sulfur-bearing Ions in the Ionosphere of Comet Halley. *M. L. Marconi, D. A. Mendis, D. L. Mitchell, R. P. Lin, A. Korib, & H. Rème.* 378, 756, 161-F7 (1991)
- MITCHELL, G. F.** Episodic Outflows from High-Mass Protostars. *G. F. Mitchell, J.-P. Maillard, & T. I. Hasegawa.* 371, 342, 64-D1 (1991)
- MITCHELL, GEORGE F.** An Extremely High Velocity CO Outflow from NGC 7538 IRS 9. *George F. Mitchell & Tatsuhiko I. Hasegawa.* 371, L33, 66-E1 (1991)
- MITCHELL, W. E., JR.** Line-blanketing Variations in the Irradiance Spectrum of the Sun from Maximum to Minimum of the Solar Cycle. *W. E. Mitchell, Jr., & W. C. Livingston.* 372, 336, 78-B6 (1991)
- MITRA, ABHAS.** Problems of Ultra-High-Energy Particle Acceleration in Cygnus X-3: A Critical Reappraisal. *Abhas Mitra.* 370, 345, 51-E7 (1991)
- MITRA, BANASHREE.** Ionization States of the Anomalous Cosmic Rays. *R. K. Singh, Banashree Mitra, N. Durgaprasad, S. Biswas, M. N. Vahia, J. S. Yadav, A. Dutta, & J. N. Goswami.* 374, 753, 108-D7 (1991)
- mitsuda, k.** See TAN, J., et al. Changes in the 11 Minute Period of 4U 1820-30.
- Observations of Scorpius X-1 with IUE: Ultraviolet Results from a Multiwavelength Campaign. *S. D. Vrilek, W. Penninx, J. C. Raymond, F. Verbunt, P. Heriz, K. Wood, W. H. G. Lewin, & K. Mitsuda.* 376, 278, 128-D1 (1991)
- See WOOD, K. S., et al. Searches for Millisecond Pulsations in Low-Mass X-Ray Binaries.
- mitsuda, kazuhisa.** Application of a General Relativistic Accretion Disk Model to LMC X-1, LMC X-3, X1608-522, and X1636-536. *Ken Ebisawa, Kazuhisa Mitsuda, & Tomoyuki Hanawa.* 367, 213, 14-F8 (1991)
- MITSUI, K.** See MURAKI, Y., et al. Observations of Ultra-High-Energy Photons from Cygnus X-3.
- MITTAZ, J. D. P.** See GIOMMI, P., et al. The EXOSAT High Galactic Latitude Survey.
- MIYAKE, S.** See ADARKAR, H., et al. Search for High-Energy Neutrinos from Celestial Sources in the Kolar Gold Fields Experiment.
- MIYAMOTO, SIGENORI.** A Jet Model for a Very High State of GX 339-4. *Sigenori Miyamoto & Shunji Kitamoto.* 374, 741, 108-C6 (1991)
- Decrease in the Orbital Period of Hercules X-1. *John E. Deeter, Paul E. Boynton, Sigenori Miyamoto, Shunji Kitamoto, Fumiaki Nagase, & Nobuyuki Kawai.* 383, 324, 216-C1 (1991)
- X-Ray Variability of GX 339-4 in Its Very High State. *Sigenori Miyamoto, Kazuhiro Kimura, Shunji Kitamoto, Tadayasu Dotani, & Ken Ebisawa.* 383, 784, 224-A3 (1991)
- MIZUNO, A.** A Study of  $^{13}\text{CO}$  Cloud Cores in Ophiuchus. *S. Nozawa, A. Mizuno, Y. Teshima, H. Ogawa, & Y. Fukui.* 77, 647, 53-E6 (1991)
- MIZUTANI, KOHEI.** See SHIBAI, HIROSHI, et al. Large-Scale [C II] 158 Micron Emission from the Galaxy.
- MOFFAT, ANTHONY F. J.** Ultraviolet Variability of the Massive W-R Binary System HDE 311884 = WR 47. *Gloria Koenigsberger, Anthony F. J. Moffat, & Lawrence H. Auer.* 376, 272, 128-C9 (1991)
- MOFFAT, J. W.** White Dwarf and Neutron Star Interior Solutions in the Nonsymmetric Gravitational Theory. *L. M. Campbell, J. W. Moffat, & P. Savaria.* 372, 241, 77-A1 (1991)
- MOHANTY, G.** See AKERLOF, C. W., et al. Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy.
- MOLES, M.** Physically Permitted Cosmological Models with Nonzero Cosmological Constant. *M. Moles.* 382, 369, 206-B9 (1991)

- MOLLAAGHABA, R. The Millimeter-Wave Spectrum of Highly vibrationally Excited SiO. *R. Mollaaghbab, C. A. Gottlieb, J. M. Vrilek, & P. Thaddeus.* 368, L19, 28-D1 (1991)
- MONAGHAN, JOE J. A Simulation of the Collapse and Fragmentation of Cooling Molecular Clouds. *Joe J. Monaghan & John C. Lattanzio.* 375, 177, 113-C1 (1991)
- Gravitational Fragmentation: A Comparison with W49A. *Eric R. Keto, John C. Lattanzio, & Joe J. Monaghan.* 383, 639, 222-B12 (1991)
- MONDAL, N. K. See ADARKAR, H., et al. Search for High-Energy Neutrinos from Celestial Sources in the Kolar Gold Fields Experiment.
- MONTANI, J. A  $^{12}\text{CO}$  Survey of the Small Magellanic Cloud. *M. Rubio, G. Garay, J. Montani, & P. Thaddeus.* 368, 173, 25-C1 (1991)
- MONTESINOS, BENJAMIN. Siphon Flows in Isolated Magnetic Flux Tubes. IV. Critical Flows with Standing Tube Shocks. *John H. Thomas & Benjamin Montesinos.* 375, 404, 115-G11 (1991)
- MONTGOMERY, D. See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- MONTGOMERY, DAVID. Statistical-Mechanical Selection of the Shapes of Disk Galaxies. *David Montgomery & Y. C. Lee.* 368, 380, 29-G1 (1991)
- MONTMERLE, THIERRY. A Rich Cluster of Radio Stars in the  $\rho$  Ophiuchi Cloud Cores. *James A. Leous, Eric D. Feigelson, Philippe André, & Thierry Montmerle.* 379, 683, 173-B10 (1991)
- MOORE, MARLA H. The SiH Vibrational Stretch as an Indicator of the Chemical State of Interstellar Grains. *Marla H. Moore, Toshihiko Tanabé, & Joseph A. Nuth.* 373, L31, 91-D7 (1991)
- MOORE, R. L. Magnetic Confinement, Alfvén Wave Reflection, and the Origins of X-Ray and Mass-Loss "Dividing Lines" for Late-Type Giants and Supergiants. *R. Rosner, C.-H. An, Z. E. Musielak, R. L. Moore, & S. T. Suess.* 372, L91, 85-E5 (1991)
- Alfvén Wave Trapping, Network Microflaring, and Heating in Solar Coronal Holes. *R. L. Moore, Z. E. Musielak, S. T. Suess, & C.-H. An.* 378, 347, 155-C5 (1991)
- MOORHEAD, J. M. Emission Features in the Spectrum of NGC 7027 near 3.3 Microns by Very High Resolution. *R. P. Lowe, J. M. Moorhead, W. H. Wehlau, & J.-P. Maillard.* 368, 195, 25-E1 (1991)
- MOOS, H. W. Studies of H I and D I in the Local Interstellar Medium: Erratum. *J. Murthy, R. C. Henry, H. W. Moos, A. Vidal-Madjar, J. L. Linsky, & C. Gry.* 378, 455, 156-E8 (1991) (Orig. paper in 356, 223, 101-G5 (1990))
- See FELDMAN, P. D., et al. Observations of Comet Levy (1990c) with the Hopkins Ultraviolet Telescope.
- Determination of Ionic Abundances in the Io Torus Using the Hopkins Ultraviolet Telescope. *H. W. Moos, P. D. Feldman, S. T. Durrance, W. P. Blair, C. W. Bowers, A. F. Davidsen, W. V. Dixon, H. C. Ferguson, R. C. Henry, R. A. Kimble, G. A. Kriss, J. W. Kruk, K. S. Long, & O. Vancura.* 382, L105, 211-F3 (1991)
- MOOS, H. WARREN. See BLAIR, WILLIAM P., et al. Discovery of a Fast Radiative Shock Wave in the Cygnus Loop Using the Hopkins Ultraviolet Telescope.
- See LONG, KNOX S., et al. Spectroscopy of Z Camelopardalis in Outburst with the Hopkins Ultraviolet Telescope.
- See FERGUSON, HENRY C., et al. Constraints on the Origin of the Ultraviolet Upturn in Elliptical Galaxies from Hopkins Ultraviolet Telescope Observations of NGC 1399.
- MORAAL, H. Heliospheric Effects on Cosmic-Ray Electrons. *H. Moraal, J. R. Jokipii, & R. A. Mewaldt.* 367, 191, 14-D8 (1991)
- MORABITO, D. D. See KRISHER, T. P., et al. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of Voyager 2.
- MORAES, F. Multimission Observations of 4U 1538-52. *L. R. Cominsky & F. Moraes.* 370, 670, 56-F10 (1991)
- MORAN, JAMES M. VLBI Observations of Interstellar Ammonia Masers. *Preeti Pratap, Karl M. Menten, Mark J. Reid, James M. Moran, & C. Malcolm Walmsley.* 373, L13, 91-B12 (1991)
- The Dense Molecular Envelope around the Compact H II Region G5.89-0.39 (W28 A2). *Yolanda Gómez, Luis F. Rodríguez, Guido Garay, & James M. Moran.* 377, 519, 146-B9 (1991)
- MORBET, CHRISTOPHER. Diameters of Galactic Globular Clusters. *Sidney van den Bergh, Christopher Morbet, & John Pazder.* 375, 594, 120-B1 (1991)
- MORELLI, E. X-Ray Observations of the Seyfert 1 Galaxy Markarian 464. *L. Piro, G. Matz, F. Costa, D. Dal Fiume, F. Frontera, & E. Morelli.* 380, 357, 182-F9 (1991)
- MORENO, G. Spatial Distribution of the Interplanetary Dust Deduced by Infrared Observations. *P. de Bernardis, F. Feminella, & G. Moreno.* 370, 396, 52-B10 (1991)
- MORENO, H. Two Planetary Nebulae in the Direction of the Galactic Center. *A. Gutiérrez-Moreno, H. Moreno, & G. Cortés.* 383, 174, 214-C1 (1991)
- MORGAN, E. See TAN, J., et al. Changes in the 11 Minute Period of 4U 1820-30.
- MORGAN, JAMES A. Molecular Outflows in the L1641 Region of Orion. *James A. Morgan & John Bally.* 372, 505, 82-B1 (1991)
- Molecular Outflows Associated with Young Stellar Objects in the L1641 Region of Orion. *James A. Morgan, F. Peter Schloerb, Ronald L. Snell, & John Bally.* 376, 618, 134-A12 (1991)
- MORIARTY-SCHIEVEN, G. H. A Second Outflow from L1551/IRS 5? *G. H. Moriarty-Schieven & P. G. Wannier.* 373, L23, 91-C8 (1991)
- Probing the Core of Cepheus A: Millimeter and Submillimeter Observations. *G. H. Moriarty-Schieven, R. L. Snell, & V. A. Hughes.* 374, 169, 100-B3 (1991)
- See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- MORIKAWA, MASAHIRO. Universe with Oscillating Expansion Rate. *Masahiro Morikawa.* 369, 20, 36-C5 (1991)
- MORITA, KOH-ICHIRO. A Finger-like Extension of the 20 Kilometer per Second Cloud toward the Galactic Center. *Sachiko K. Okumura, Masato Ishiguro, Edward B. Fomalont, Tetsuo Hasegawa, Takashi Kasuga, Koh-Ichiro Morita, Ryohei Kawabe, & Hideyuki Kobayashi.* 378, 127, 152-E9 (1991)
- MORRELL, NIDIA. Spectroscopic Binaries in the Open Cluster Trumpler 16. *Hugo Levato, Stella Malaroda, Nidia Morrell, Beatriz García, & Carlos Hernández.* 75, 869, 13-C13 (1991)
- Spectroscopic Binaries in the Orion OB1 Association. *Nidia Morrell & Hugo Levato.* 75, 965, 15-F5 (1991)
- Reinvestigation of the Binary Frequency in the Open Cluster IC 4665. *Nidia Morrell & Helmut A. Abt.* 378, 157, 153-A1 (1991)
- MORRIS, MARK. Warm Neutral Halos around Molecular Clouds. III. Interpretation of H I and CO  $J = 1-0$  Data. *B.-G Andersson, Peter G. Wannier, & Mark Morris.* 366, 464, 8-F1 (1991)
- Far-Infrared Line and Continuum Observations of G0.095+0.012 and the E2 Thermal Radio Filament near the Galactic Center. *Edwin F. Erickson, Sean W. J. Colgan, J. P. Simpson, Robert H. Rubin, Mark Morris, & Michael R. Haas.* 370, L69, 59-C1 (1991)
- Warm Neutral Halos around Molecular Clouds. II. H I and CO ( $J = 1-0$ ) Observations. *Peter G. Wannier, B.-G Andersson, Mark Morris, & Steven M. Lichten.* 75, 987, 16-B1 (1991)
- A Windswiped Cometary Tail on the Galactic Center Supergiant IRS 7. *F. Yusef-Zadeh & Mark Morris.* 371, L59, 73-B10 (1991)
- MORRIS, S. L. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- The Number Count Distribution for X-Ray-selected BL Lacertae Objects and Constraints on the Luminosity Function. *Anna Wolter, I. M. Gioia, T. Maccacaro, S. L. Morris, & J. T. Stocke.* 369, 314, 41-F5 (1991)
- MORRIS, SIMON L. The Appearance of a New Redshift System in Markarian 231. *Todd A. Boroson, Karie A. Meyers, Simon L. Morris, & S. E. Persson.* 370, L19, 53-D1 (1991)
- Comparisons of the Emission-Line and Continuum Properties of Broad Absorption Line and Normal Quasi-stellar Objects. *Ray J. Weymann, Simon L. Morris, Craig B. Foltz, & Paul C. Hewett.* 373, 23, 86-C13 (1991)
- A High Signal-to-Noise Ratio Composite Quasar Spectrum. *Paul J. Francis, Paul C. Hewett, Craig B. Foltz, Frederic H. Chaffee, Ray J. Weymann, & Simon L. Morris.* 373, 465, 93-F10 (1991)
- The Properties of X-Ray-selected Active Galactic Nuclei. I. Luminosity Function, Cosmological Evolution, and Contribution to the Diffuse X-Ray Background. *Tommaso Maccacaro, Roberto*

- Della Ceca, Isabella M. Gioia, Simon L. Morris, John T. Stocke, & Anna Wolter.* 374, 117, 99-D11 (1991)
- The Einstein Observatory Extended Medium-Sensitivity Survey. II. The Optical Identifications. *John T. Stocke, Simon L. Morris, I. M. Gioia, T. Maccacaro, R. Schild, A. Wolter, Thomas A. Fleming, & J. Patrick Henry.* 76, 813, 36-B1 (1991)
- First Results from the Goddard High-Resolution Spectrograph: The Galactic Halo and the Ly $\alpha$  Forest at Low Redshift in 3C 273. *Simon L. Morris, Ray J. Weymann, Blair D. Savage, & Ronald L. Gilliland.* 377, L21, 143-C11 (1991)
- The Luminosity Function and Cosmological Evolution of X-Ray-selected BL Lacertae Objects. *Simon L. Morris, John T. Stocke, Isabella M. Gioia, Rudy E. Schild, Anna Wolter, Tommaso Maccacaro, & Roberto Della Ceca.* 380, 49, 176-F1 (1991)
- MORTON, DONALD C. Atomic Data for Resonance Absorption Lines. I. Wavelengths Longward of the Lyman Limit. *Donald C. Morton.* 77, 119, 45-B1 (1991)
- MORTON, SCOTT A. Ambipolar Diffusion, Cloud Cores, and Star Formation: Two-dimensional, Cylindrically Symmetric Contraction. I. The Issues, Formulation of the Problem, and Method of Solution. *Telemachos Ch. Mouschovias & Scott A. Morton.* 371, 296, 63-G1 (1991)
- MOSELEY, S. H. See SMOOTH, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- MOSELEY, S. H., JR. See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a 7° Beam by the Cosmic Background Explorer (COBE).
- MOSKALIK, PAWEŁ. Periodic Stellar Pulsations: Stability Analysis and Amplitude Equations. *J. Robert Buchler, Paweł Moskalik, & Géza Kovács.* 380, 185, 178-D1 (1991)
- MOTCH, C. Accretion Mechanisms in the Be/X-Ray Transient System A0535+26. *C. Motch, L. Stella, E. Janot-Pacheco, & M. Mouchet.* 369, 490, 43-G5 (1991)
- X-Ray to Infrared Observations of the AM Herculis System E1405–451 (V834 Centauri). *R. M. Sambruna, L. Chiappetti, A. Treves, J. M. Bonnet-Bidaud, P. Bouchet, L. Maraschi, C. Motch, & M. Mouchet.* 374, 744, 108-C10 (1991)
- MOTOYAMA, S. Measurement of the Neutron Capture Rate of the  $^{12}\text{C}(n,\gamma)^{13}\text{C}$  Reaction at Stellar Energy. *Y. Nagai, M. Igashira, K. Takeda, N. Mukai, S. Motoyama, F. Uesawa, H. Kitazawa, & T. Fukuda.* 372, 683, 84-B7 (1991)
- MOUCHET, M. Accretion Mechanisms in the Be/X-Ray Transient System A0535+26. *C. Motch, L. Stella, E. Janot-Pacheco, & M. Mouchet.* 369, 490, 43-G5 (1991)
- X-Ray to Infrared Observations of the AM Herculis System E1405–451 (V834 Centauri). *R. M. Sambruna, L. Chiappetti, A. Treves, J. M. Bonnet-Bidaud, P. Bouchet, L. Maraschi, C. Motch, & M. Mouchet.* 374, 744, 108-C10 (1991)
- MOULD, J. R. The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. I. Southern Clusters. *J. R. Mould, L. Staveley-Smith, R. A. Schommer, G. D. Bothun, P. J. Hall, Ming Sheng Han, J. P. Huchra, J. Roth, W. Walsh, & A. E. Wright.* 383, 467, 220-B7 (1991)
- MOUNTAIN, C. M. Molecular and Atomic Hydrogen Line Emission from Star-forming Galaxies: Erratum. *P. J. Pixley, T. G. Hawarden, & C. M. Mountain.* 372, 733, 84-F13 (1991) (Orig. paper in 364, 77, 195-A1 (1990))
- See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- MOUSCHOVIAS, TELEMACHOS CH. Ambipolar Diffusion, Cloud Cores, and Star Formation: Two-dimensional, Cylindrically Symmetric Contraction. I. The Issues, Formulation of the Problem, and Method of Solution. *Telemachos Ch. Mouschovias & Scott A. Morton.* 371, 296, 63-G1 (1991)
- Magnetic Braking, Ambipolar Diffusion, Cloud Cores, and Star Formation: Natural Length Scales and Protostellar Masses. *Telemachos Ch. Mouschovias.* 373, 169, 88-B3 (1991)
- MOUTARDE, F. Precollapse Scale Invariance in Gravitational Instability. *F. Moutarde, J.-M. Alimi, F. R. Bouchet, R. Pellat, & A. Ramani.* 382, 377, 206-C5 (1991)
- MUCIACCIA, PIO FRANCESCO. Limits on Cold Dark Matter Cosmologies from New Anisotropy Bounds on the Cosmic Microwave Background. *Nicola Vittorio, Peter Meinhold, Pio Fráncesco Muciaccia, Philip Lubin, & Joseph Silk.* 372, L1, 79-A7 (1991)
- MÜLLER, DIETRICH. Energy Spectra and Composition of Primary Cosmic Rays. *Dietrich Müller, Simon P. Swordy, Peter Meyer, Jacques L'Heureux, & John M. Grunsfeld.* 374, 356, 102-E1 (1991)
- MÜLLER, EWALD. Instabilities and Clumping in SN 1987A. I. Early Evolution in Two Dimensions. *Bruce Fryxell, Ewald Müller, & David Arnett.* 367, 619, 21-A5 (1991)
- MÜLLER, J. Testing Einstein's Theory of Gravity by Analyzing Lunar Laser Ranging Data. *J. Müller, M. Schneider, M. Soffel, & H. Ruder.* 382, L101, 211-E12 (1991)
- MUELLER, JEAN. See DUNCAN, DOUGLAS K., et al. Ca II H and K Measurements Made at Mount Wilson Observatory, 1966–1983.
- MÜLLER-PLATHE, FLORIAN. Theoretical Determination of the Spectroscopic Constants of the MgC Molecule. *Marcos A. Castro, Sylvio Canuto, & Florian Müller-Plathe.* 367, L69, 22-D3 (1991)
- MUKAI, K. A New Candidate Orbital Period for KO Velorum (E1013–477). *K. Mukai & R. H. D. Corbet.* 378, 701, 161-B3 (1991)
- MUKAI, N. Measurement of the Neutron Capture Rate of the  $^{12}\text{C}(n,\gamma)^{13}\text{C}$  Reaction at Stellar Energy. *Y. Nagai, M. Igashira, K. Takeda, N. Mukai, S. Motoyama, F. Uesawa, H. Kitazawa, & T. Fukuda.* 372, 683, 84-B7 (1991)
- See NAGAI, Y., et al. Capture Rate of the  $^7\text{Li}(n, \gamma)^8\text{Li}$  Reaction by Prompt Gamma-Ray Detection.
- MULLAN, D. J. Inefficient Accretion by the DA2 White Dwarf in V471 Tauri. *D. J. Mullan, H. L. Shipman, E. M. Sion, & J. MacDonald.* 374, 707, 107-G8 (1991)
- Three-dimensional Compressible Hydrodynamic Convection in the Sun and Stars. *Murshed Hossain & D. J. Mullan.* 380, 631, 186-A10 (1991)
- MUMMA, MICHAEL J. Molecular Hydrogen in the Vicinity of NGC 7538 IRS 1 and IRS 2: Temperature and Ortho-to-Para Ratio. *Susan Hoban, Dennis C. Reuter, Michael J. Mumma, & Alex D. Storrs.* 370, 228, 50-A10 (1991)
- MUNDT, R. The High State of the FU Orionis Variable Z Canis Majoris. *F. V. Hessman, J. Eisloffel, R. Mundt, L. W. Hartmann, W. Herbst, & J. Krautter.* 370, 384, 52-A10 (1991)
- MUNDT, REINHARD. An Optical/Infrared Outburst in the Exciting Source of HH 7–11. *Jochen Eisloffel, Eike Günther, Frederic V. Hessman, Reinhard Mundt, Ralf Poetzel, John S. Carr, Steven Beckwith, & Tom P. Ray.* 383, L19, 219-C7 (1991)
- MUNDY, LEE G. CS Multitransitional Studies of Density Distribution in Star-forming Regions. I. The NGC 2071 Region. *Shudong Zhou, Neal J. Evans II, Rolf Güsten, Lee G. Mundy, & Marc L. Kutner.* 372, 518, 82-C1 (1991)
- Synthesis Imaging of the DR 21(OH) Cluster. I. Dust Continuum and  $\text{C}^{18}\text{O}$  Emission. *Jeffrey G. Mangum, Alwyn Wootten, & Lee G. Mundy.* 378, 576, 159-E3 (1991)
- MURAKAMI, T.  $V/V_{\max}$  Test Applied to Ginga Gamma-Ray Bursts. *Y. Ogasaka, T. Murakami, J. Nishimura, A. Yoshida, & E. E. Fenimore.* 383, L61, 226-D6 (1991)
- MURAKI, Y. Observations of Ultra-High-Energy Photons from Cygnus X-3. *Y. Muraki, S. Shibata, T. Aoki, K. Mitsui, A. Okada, Y. Ohashi, K. Kobayakawa, H. Kojima, T. Kitamura, Y. Kato, T. Takahashi, & I. Nakamura.* 373, 657, 96-B4 (1991)
- MURATA, YASUHIRO. The Dense, Inner Part of the Protostellar Disk: Protostellar Candidates in GGD 27 IRS. *Takuya Yamashita, Yasuhiro Murata, Ryoei Kawabe, Norio Kaifu, & Motohide Tamura.* 373, 560, 95-A1 (1991)
- Aperture Synthesis CS(2–1) Observations of a Young Stellar Object GL 490: Accretion Flow in Gas Disk. *Akiko Nakamura, Ryoei Kawabe, Yoshimi Kitamura, Masato Ishiguro, Yasuhiro Murata, & Nagayoshi Ohashi.* 383, L81, 226-F5 (1991)
- MURDIN, P. See GIOMMI, P., et al. The EXOSAT High Galactic Latitude Survey.
- MURDOCK, T. L. See SMOOTH, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a 7° Beam by the Cosmic Background Explorer (COBE).

- MURPHY, BRIAN. Fokker-Planck Calculations of Star Clusters with Primordial Binaries. *Bin Gao, Jeremy Goodman, Haldan Cohn, & Brian Murphy.* 370, 567, 55-E1 (1991)
- MURPHY, BRIAN W. Dynamical and Luminosity Evolution of Active Galactic Nuclei: Models with Mass Spectrum. *Brian W. Murphy, Haldan N. Cohn, & Richard H. Durisen.* 370, 60, 47-G1 (1991)
- MURPHY, R. J. Solar Abundances from Gamma-Ray Spectroscopy: Comparisons with Energetic Particle, Photospheric, and Coronal Abundances. *R. J. Murphy, R. Ramaty, B. Kozlovsky, & D. V. Reames.* 371, 793, 71-D6 (1991)
- MURRAY, N. Short-Term Changes in Solar Oscillation Frequencies and Solar Activity. *M. F. Woodard, J. R. Kuhn, N. Murray, & K. G. Libbrecht.* 373, L81, 97-F12 (1991)
- MURRAY, NORMAN. Implications of Solar p-Mode Frequency Shifts. *Peter Goldreich, Norman Murray, Gregory Willette, & Pawan Kumar.* 370, 752, 57-F12 (1991)
- MURRAY, S. S. The CfA Einstein Observatory Extended Deep X-Ray Survey. *F. A. Primini, S. S. Murray, J. Huchra, R. Schild, R. Burg, & R. Giacconi.* 374, 440, 104-E12 (1991)
- MURRAY, STEPHEN D. Thermal Instabilities in Proto-Globular Clusters Resulting from Time-dependent Potentials. *Stephen D. Murray & Douglas N. C. Lin.* 367, 149, 13-G6 (1991)
- The Formation of Primordial Binaries in Globular Clusters by Star-Disk Interactions. *Stephen D. Murray, C. J. Clarke, & J. E. Pringle.* 383, 192, 214-D7 (1991)
- MURTHY, J. Studies of H I and D I in the Local Interstellar Medium: Erratum. *J. Murthy, R. C. Henry, H. W. Moos, A. Vidal-Madjar, J. L. Linsky, & C. Gry.* 378, 455, 156-E8 (1991) (Orig. paper in 356, 223, 101-G5 (1990))
- MURTHY, JAYANT. Constraints on the Optical Properties of Interstellar Dust in the Far-Ultraviolet: Voyager Observations of the Diffuse Sky Background. *Jayant Murthy, R. C. Henry, & J. B. Holberg.* 383, 198, 214-E1 (1991)
- MUSHOTZKY, R. F. Einstein Observatory SSS and MPC Observations of the Complex X-Ray Spectra of Seyfert Galaxies. *T. J. Turner, K. A. Weaver, R. F. Mushotzky, S. S. Holt, & G. M. Madejski.* 381, 85, 190-B1 (1991)
- MUSHOTZKY, RICHARD F. A Ubiquitous Absorption Feature in the X-Ray Spectra of BL Lacertae Objects. *Greg M. Madejski, Richard F. Mushotzky, Kimberly A. Weaver, Keith A. Arnaud, & C. Megan Urry.* 370, 198, 49-F1 (1991)
- Cross-Correlation of the X-Ray Background with Nearby Galaxies. *Keith Jahoda, Ofer Lahav, Richard F. Mushotzky, & Elihu Boldt.* 378, L37, 162-D7 (1991)
- MUSIELAK, Z. E. Magnetic Confinement, Alfvén Wave Reflection, and the Origins of X-Ray and Mass-Loss "Dividing Lines" for Late-Type Giants and Supergiants. *R. Rosner, C.-H. An, Z. E. Musielak, R. L. Moore, & S. T. Suess.* 372, L91, 85-E5 (1991)
- Alfvén Wave Trapping, Network Microflaring, and Heating in Solar Coronal Holes. *R. L. Moore, Z. E. Musielak, S. T. Suess, & C.-H. An.* 378, 347, 155-C5 (1991)
- MUTOH, HARUHIKO. The Rosseland Mean Free-Free Gaunt Factor of the Dense High-Temperature Stellar Plasma. *Naoki Itoh, Fumiyoji Kuwashima, Koki Ichihashi, & Haruhiko Mutoh.* 382, 636, 209-E1 (1991)
- MYERS, P. C. Thermal and Nonthermal Motions in Dense Cores. *P. C. Myers, E. F. Ladd, & G. A. Fuller.* 372, L95, 85-E9 (1991)
- On the Dispersion in Direction of Interstellar Polarization. *P. C. Myers & A. A. Goodman.* 373, 509, 94-C9 (1991)
- Anatomy of the Barnard 5 Core. *G. A. Fuller, P. C. Myers, W. J. Welch, P. F. Goldsmith, W. D. Langer, B. G. Campbell, S. Guilloteau, & R. W. Wilson.* 376, 135, 126-E10 (1991)
- Dense Cores in Dark Clouds. VI. Shapes. *P. C. Myers, G. A. Fuller, A. A. Goodman, & P. J. Benson.* 376, 561, 133-D1 (1991)
- Far-Infrared and Submillimeter Wavelength Observations of Star-forming Dense Cores. II. Images. *E. F. Ladd, Fred C. Adams, S. Casey, J. A. Davidson, G. A. Fuller, D. A. Harper, P. C. Myers, & R. Padman.* 382, 555, 208-D7 (1991)
- MYERS, S. T. High-Resolution Aperture Synthesis of Molecular Gas in NGC 1068. *P. Planesas, N. Scoville, & S. T. Myers.* 369, 364, 42-C9 (1991)
- NADEAU, D. A Spectroscopic Study of the DR 21 Outflow Source. II. The Vibrational H<sub>2</sub> Line Emission. *R. P. Garden, T. R. Geballe, J. Gatley, & D. Nadeau.* 366, 474, 8-G1 (1991)
- NADEAU, DANIEL. The Extinction to the H<sub>2</sub> Line Emission in the DR 21 Outflow Source. *Daniel Nadeau, Martin Riopel, & T. R. Geballe.* 372, L103, 85-F5 (1991)
- Infrared and Visible Photometry of the Gravitational Lens System 2237+030. *Daniel Nadeau, H. K. C. Yee, W. J. Forrest, J. D. Garnett, Z. Ninkov, & J. L. Pipher.* 376, 430, 131-G1 (1991)
- NAGAI, Y. Measurement of the Neutron Capture Rate of the <sup>12</sup>C(n,γ)<sup>13</sup>C Reaction at Stellar Energy. *Y. Nagai, M. Igashira, K. Takeda, N. Mukai, S. Motoyama, F. Uesawa, H. Kitazawa, & T. Fukuda.* 372, 683, 84-B7 (1991)
- Capture Rate of the <sup>7</sup>Li(n,γ)<sup>8</sup>Li Reaction by Prompt Gamma-Ray Detection. *Y. Nagai, M. Igashira, N. Mukai, T. Ohsaki, F. Uesawa, K. Takeda, T. Ando, H. Kitazawa, S. Kubono, & T. Fukuda.* 381, 444, 196-C1 (1991)
- NAGASE, F. Cyclotron Line Features in the Spectrum of the Transient X-Ray Pulsar X0115+634. *F. Nagase, T. Dotani, Y. Tanaka, K. Makishima, T. Miura, T. Sakao, H. Tsunemi, S. Kitamoto, K. Tamura, A. Yoshida, & H. Nakamura.* 375, L49, 124-B11 (1991)
- Discovery of a Cyclotron Resonance Feature at 30 keV from the Transient X-Ray Pulsar Cepheus X-4. *T. Miura, K. Makishima, S. Kamijo, T. Ohashi, F. Nagase, Y. Tanaka, & K. Koyama.* 379, L61, 175-C6 (1991)
- LMC X-4: Ginga Observations and Search for Orbital Period Changes. *A. Levine, S. Rappaport, A. Putney, R. Corbet, & F. Nagase.* 381, 101, 190-C7 (1991)
- NAGASE, FUMIAKI. Decrease in the Orbital Period of Hercules X-1. *John E. Deeter, Paul E. Boynton, Sigeyori Miyamoto, Shunji Kitamoto, Fumiaki Nagase, & Nobuyuki Kawai.* 383, 324, 216-C1 (1991)
- NAGATA, T. High-Resolution Spectra of the 3.29 Micron Interstellar Emission Feature: A Summary. *A. T. Tokunaga, K. Sellgren, R. G. Smith, T. Nagata, A. Sakata, & Y. Nakada.* 380, 452, 183-G8 (1991)
- NAGLE, D. E. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- NAKADA, Y. High-Resolution Spectra of the 3.29 Micron Interstellar Emission Feature: A Summary. *A. T. Tokunaga, K. Sellgren, R. G. Smith, T. Nagata, A. Sakata, & Y. Nakada.* 380, 452, 183-G8 (1991)
- NAKAGAWA, TAKAO. See SHIBAI, HIROSHI, et al. Large-Scale [C II] 158 Micron Emission from the Galaxy.
- NAKAJIMA, TADASHI. Near-Infrared Long-Slit Spectroscopy of IRAS 14348-1447. *Tadashi Nakajima, Kimiaki Kawara, Minoru Nishida, & Brooke Gregory.* 373, 452, 93-E6 (1991)
- Infrared Broad Emission Lines from an Obscured Quasar. *IRAS 23060+0505. Tadashi Nakajima, Nathaniel P. Carleton, & Minoru Nishida.* 375, L1, 117-A7 (1991)
- NAKAMURA, AKIKO. Aperture Synthesis CS(2-1) Observations of a Young Stellar Object GL 490: Accretion Flow in Gas Disk. *Akiko Nakamura, Ryohei Kawabe, Yoshimi Kitamura, Masato Ishiguro, Yasuhiro Murata, & Nagayoshi Ohashi.* 383, L81, 226-F5 (1991)
- NAKAMURA, H. See NAGASE, F., et al. Cyclotron Line Features in the Spectrum of the Transient X-Ray Pulsar X0115+634.
- NAKAMURA, I. See MURAKI, Y., et al. Observations of Ultra-High-Energy Photons from Cygnus X-3.
- NAKAMURA, T. See ADARKAR, H., et al. Search for High-Energy Neutrinos from Celestial Sources in the Kolar Gold Fields Experiment.
- NAKAMURA, TAKASHI. The Origin of the Planet around PSR 1829-10. *Takashi Nakamura & Tsvi Piran.* 382, L81, 211-C13 (1991)
- NAKANO, TAKENORI. Magnetic Flux Loss from Interstellar Clouds with Various Grain-Size Distributions. *Ryoichi Nishi, Takenori Nakano, & Toyoharu Umebayashi.* 368, 181, 25-C11 (1991)
- NAMBU, YASUSADA. Anisotropies of the Cosmic Background Radiation by Domain Wall Networks. *Yasusada Nambu, Hideki Ishihara, Naoteru Gouda, & Naoshi Sugiyama.* 373, L35, 97-A11 (1991)
- NARASIMHAM, V. S. See ADARKAR, H., et al. Search for High-Energy Neutrinos from Celestial Sources in the Kolar Gold Fields Experiment.
- NARAYAN, RAMESH. Does Accretion Cease When a Star Approaches Breakup? *Robert Popham & Ramesh Narayan.* 370, 604, 56-A6 (1991)

- Gravitational Lensing, Time Delay, and Angular Diameter Distance. *Ramesh Narayan*. 378, L5, 157-B1 (1991)
- Neutron Star and Black Hole Binaries in the Galaxy. *Ramesh Narayan, Tsvi Piran, & Amotz Shemi*. 379, L17, 169-B11 (1991)
- NASH, A. G. A New Solar Cycle Model Including Meridional Circulation. *Y.-M. Wang, N. R. Sheeley, Jr., & A. G. Nash*. 383, 431, 217-F1 (1991)
- NASH, ANA G. Rotation of the Sun's Outer White-Light Corona Determined from Solwind Data. *Ana G. Nash*. 366, 592, 10-D1 (1991)
- NATHER, R. E. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- NATTA, A. Infrared Spectroscopy of T Tauri Stars. *C. Giovanardi, S. Gennari, A. Natta, & R. Stanga*. 367, 173, 14-B11 (1991)
- NAVARRETE, M. The Evolution and Classification of Postoutburst Novae Spectra. *R. E. Williams, M. Hamuy, M. M. Phillips, S. R. Heathcote, Lisa Wells, & M. Navarrete*. 376, 721, 135-C7 (1991)
- NAVARRO, JULIO F. Dynamics of Cooling Gas in Galactic Dark Halos. *Julio F. Navarro & Willy Benz*. 380, 320, 182-C7 (1991)
- NEDOLUHA, GERALD E. Spectral Line Profiles and Luminosities of Astrophysical Water Masers. *Gerald E. Nedoluha & William D. Watson*. 367, L63, 22-C11 (1991)
- NEFF, SUSAN G. See BOHLIN, RALPH C., et al. Simulated Optical Images of Galaxies at  $z \sim 1$  Using Ultraviolet Images of Nearby Galaxies.
- NEL, H. I. No Evidence for TeV Gamma Radiation from 2CG 006-00. *H. I. Nel, B. C. Raubenheimer, O. C. de Jager, R. Buccieri, M. Busetta, A. R. North, & C. Brink*. 368, 585, 32-D4 (1991)
- NELAN, E. See FRANZ, O. G., et al. Binary Star Observations with the Hubble Space Telescope Fine Guidance Sensors. I. ADS 11300.
- NELIS, THOMAS. Atomic Oxygen Fine-Structure Splittings with Tunable Far-Infrared Spectroscopy. *Lyndon R. Zink, Kenneth M. Evenson, Fusaku Matsushima, Thomas Nelis, & Ruth L. Robinson*. 371, L85, 73-E3 (1991)
- NELSON, ROBERT W. Synchrotron Radiation with Radiation Reaction. *Robert W. Nelson & Ira Wasserman*. 371, 265, 63-D7 (1991)
- NEMEC, JAMES. The Stellar Content and Structure of the Globular Cluster NGC 5053. *Gregory G. Fahman, Harvey B. Richer, & James Nemec*. 380, 124, 177-E11 (1991)
- NEMIROFF, ROBERT J. Constraints on Weyl Gravity on Subgalactic Distance Scales. *Kent S. Wood & Robert J. Nemiroff*. 369, 54, 36-F3 (1991)
- NETZER, H. See MAOZ, D., et al. High-Rate Active Galaxy Monitoring at the Wise Observatory. III. The Broad-Line Region of NGC 4151.
- See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- NEUFELD, DAVID A. Excitation of Millimeter and Submillimeter Water Masers. *David A. Neufeld & Gary J. Melnick*. 368, 215, 25-F11 (1991)
- The Escape of Lyman-Alpha Radiation from a Multiphase Interstellar Medium. *David A. Neufeld*. 370, L85, 59-D13 (1991)
- Excitation of Millimeter and Submillimeter Water Masers: Erratum. *David A. Neufeld & Gary J. Melnick*. 374, 784, 108-G4 (1991) (Orig. paper in 368, 215, 25-F11 (1991))
- NEUGEBAUER, G. See SOIFER, B. T., et al. Near-Infrared Observations of the  $z \sim 2.3$  IRAS Source FSC 10214+4724.
- See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- NEUGEBAUER, M. Densities and Abundances of Hot Cometary Ions in the Coma of P/Halley. *M. Neugebauer, R. Goldstein, B. E. Goldstein, S. A. Fuselier, H. Balsiger, & W.-H. Ip*. 372, 291, 77-E6 (1991)
- Observations of Solar Wind Ion Charge Exchange in the Comet Halley Coma. *S. A. Fuselier, E. G. Shelley, B. E. Goldstein, R. Goldstein, M. Neugebauer, W.-H. Ip, H. Balsiger, & H. Rème*. 379, 734, 173-G8 (1991)
- NEUSCHAEFER, LYMAN W. See WINDHORST, ROGIER A., et al. The Discovery of a Young Radio Galaxy at  $z = 2.390$ : Probing Initial Star Formation at  $z \lesssim 3.0$ .
- The Galaxy Two-Point Correlation Function Down to  $V = 26$  Magnitudes on 05 Scales. *Lyman W. Neuschaefer, Rogier A. Windhorst, & Alan Dressler*. 382, 32, 200-D12 (1991)
- NEUTSCH, W. Three-dimensional Models of a Galactic Wind Expansion with Ellipsoidal Geometry. I. The Hydrodynamical Test Case. *H. Fichtner, W. Neutsch, H. J. Fahr, & R. Schlickeiser*. 371, 98, 61-C9 (1991)
- NGUYEN, H. A. NGC 7538 IRS 1: Subarcsecond Resolution Recombination Line and  $^{15}\text{NH}_3$  Maser Observations. *R. A. Gaume, K. J. Johnston, H. A. Nguyen, T. L. Wilson, H. R. Dickey, W. M. Goss, & M. C. H. Wright*. 376, 608, 133-G12 (1991)
- NICOTRA, MARIANO A. An Analysis of Abell and ACO Catalogs of Clusters of Galaxies. *Mariano A. Nicotra & Diego G. Lambas*. 382, 55, 200-F11 (1991)
- NIEL, M. See MASSARO, E., et al. Detection of a Feature at 0.44 MeV in the Crab Pulsar Spectrum with FIGARO II: A Redshifted Positron Annihilation Line?
- IGAM, ANIL. Qualitative Explanations of Red Giant Formation. *R. Bhaskar & Anil Nigam*. 372, 592, 83-A10 (1991)
- NINKOV, Z. Infrared and Visible Photometry of the Gravitational Lens System 2237+030. *Daniel Nadeau, H. K. C. Yee, W. J. Forrest, J. D. Garnett, Z. Ninkov, & J. L. Pipkin*. 376, 430, 131-G1 (1991)
- NISENSON, P. Measurements of the Diameter of the Supernova SN 1987A. *M. Karovska, P. Nisenzon, C. Standley, & S. R. Heathcote*. 367, L15, 17-C8 (1991)
- Asymmetries in the Atmosphere of Mira. *M. Karovska, P. Nisenzon, C. Papaliolios, & R. P. Boyle*. 374, L51, 110-D1 (1991)
- NISHI, RYOICHI. Magnetic Flux Loss from Interstellar Clouds with Various Grain-Size Distributions. *Ryoichi Nishi, Takenori Nakano, & Toyoharu Umebayashi*. 368, 181, 25-C11 (1991)
- NISHIDA, MINORU. Near-Infrared Long-Slit Spectroscopy of IRAS 14348-1447. *Tadashi Nakajima, Kimiaki Kawara, Minoru Nishida, & Brooke Gregory*. 373, 452, 93-E6 (1991)
- Infrared Broad Emission Lines from an Obscured Quasar, IRAS 23060+0505. *Tadashi Nakajima, Nathaniel P. Carleton, & Minoru Nishida*. 375, L1, 117-A7 (1991)
- Infrared Spectroscopy of Cygnus A: Implications for the Obscured Active Nucleus. *Martin J. Ward, Philip R. Blanco, Andrew S. Wilson, & Minoru Nishida*. 382, 115, 201-E11 (1991)
- NISHIMURA, J.  $V/V_{\max}$  Test Applied to Ginga Gamma-Ray Bursts. *Y. Ogasaka, T. Murakami, J. Nishimura, A. Yoshida, & E. E. Fenimore*. 383, L61, 226-D6 (1991)
- NISHIMURA, TETSUO. See SHIBAI, HIROSHI, et al. Large-Scale [C II] 158 Micron Emission from the Galaxy.
- NISSEN, P. E. First Detection of Beryllium in a Very Metal Poor Star: A Test of the Standard Big Bang Model. *Gerard Gilmore, Bengt Edvardsson, & P. E. Nissen*. 378, 17, 151-C1 (1991)
- NITTA, N. Coronal Magnetic Structures Observing Campaign. I. Simultaneous Microwave and Soft X-Ray Observations of Active Regions at the Solar Limb. *N. Nitta, S. M. White, M. R. Kundu, N. Gopalswamy, G. D. Holman, J. W. Brosius, J. T. Schmelz, J. L. R. Saba, & K. T. Strong*. 374, 374, 102-F11 (1991)
- NITZ, D. See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- NOBILI, LUCIANO. Spherical Accretion onto Black Holes: A Complete Analysis of Stationary Solutions. *Luciano Nobili, Roberto Turolla, & Luca Zampieri*. 383, 250, 215-C9 (1991)
- NOPAR, IRIT. The Formation of  $^{26}\text{Al}$  Nova Explosions. *Irit Nofar, Giora Shaviv, & Sumner Starrfield*. 369, 440, 43-B11 (1991)
- NOGUCHI, K. See KOYAMA, K., et al. An X-Ray Pulsator in the Direction of Molecular Cloud MBM 12 (Lynds 1457).
- NOH, HYERIM. Gravitational Instabilities in a Proto-Planetary Disk. *Hyerim Noh, Ethan T. Vishniac, & William D. Cochran*. 383, 372, 217-A1 (1991)
- NOMOTO, KEN'ICHI. Conditions for Accretion-induced Collapse of White Dwarfs. *Ken'ichi Nomoto & Yoji Kondo*. 367, L19, 17-D1 (1991)
- Rayleigh-Taylor Instabilities and Mixing in the Helium Star Models for Type Ib/Ic Supernovae. *Izumi Hachisu, Takuya Matsuda, Ken'ichi Nomoto, & Toshikazu Shigeyama*. 368, L27, 35-B4 (1991)

- The Near-Maximum-Light Spectrum of the Type Ic Supernova 1987M. *David J. Jeffery, David Branch, Alexei V. Filippenko, & Ken'ichi Nomoto.* 377, L89, 150-D10 (1991)
- NOOK, M. A. On the Wind Geometry of the Wolf-Rayet Star EZ Canis Majoris. *R. E. Schulte-Ladbeck, K. H. Nordsieck, M. Taylor, M. A. Nook, K. S. Bjorkman, A. M. Magalhães, & C. M. Anderson.* 382, 301, 204-A1 (1991)
- See BJORKMAN, K. S., et al. First Ultraviolet Spectropolarimetry of Be Stars from the Wisconsin Ultraviolet Photo-Polarimeter Experiment.
- NORDSIECK, K. H. On the Wind Geometry of the Wolf-Rayet Star EZ Canis Majoris. *R. E. Schulte-Ladbeck, K. H. Nordsieck, M. Taylor, M. A. Nook, K. S. Bjorkman, A. M. Magalhães, & C. M. Anderson.* 382, 301, 204-A1 (1991)
- See TAYLOR, M., et al. First Ultraviolet Spectropolarimetry of Hot Supergiants.
- See BJORKMAN, K. S., et al. First Ultraviolet Spectropolarimetry of Be Stars from the Wisconsin Ultraviolet Photo-Polarimeter Experiment.
- NOREAU, LOUIS. Possible Deflection of a Jet by Molecular Clouds in NGC 4258. *R. L. Plante, K. Y. Lo, Jean-René Roy, Pierre Martin, & Louis Noreau.* 381, 110, 190-D4 (1991)
- NORIEGA-CRESPO, ALBERTO. Models for Light Scattering by Dust around Herbig-Haro Objects. *Alberto Noriega-Crespo, Nuria Calvet, & Karl-Heinz Böhm.* 379, 676, 173-B1 (1991)
- NORMAN, COLIN A. Collisional Pumping of H<sub>2</sub>O Masers in Star-forming Regions. *Nikolaos D. Kylafis & Colin A. Norman.* 373, 525, 94-D13 (1991)
- What Determines the Physical Quantities of Galaxies? A Two-Component Gas Model for Protogalaxies with Energy Input from Supernovae. *Satoru Ikeuchi & Colin A. Norman.* 375, 479, 118-F9 (1991)
- NORMAN, MICHAEL L. Atmospheric Gradients and the Stability of Expanding Jets. *Philip E. Hardee, Michael L. Norman, Theodoros Kouvelis, & David A. Clarke.* 373, 8, 86-B10 (1991)
- The Fragmentation of "Pancakes" in a Dark Matter-dominated Universe. *Wenbo Yuan, Joan M. Centrella, & Michael L. Norman.* 376, L29, 137-A1 (1991)
- NORRINGTON, P. H. Relative Populations for Levels in the 3d<sup>2</sup> Ground Configuration of Fe VII. *P. P. Keenan & P. H. Norrington.* 368, 486, 31-B7 (1991)
- NORRIS, J. P. See WOOD, K. S., et al. Searches for Millisecond Pulsations in Low-Mass X-Ray Binaries.
- NORRIS, JOHN E. Population Studies. X. Constraints on the Mass and Extent of the Galaxy's Dark Corona. *John E. Norris & M. R. S. Hawkins.* 380, 104, 177-C11 (1991)
- Population Studies. XI. The Extended Disk, Halo Configuration. *John E. Norris & Sean G. Ryan.* 380, 403, 183-C6 (1991)
- NORTH, A. R. No Evidence for TeV Gamma Radiation from 2CG 006-00. *H. I. Nel, B. C. Raubenheimer, O. C. de Jager, R. Buccheri, M. Busetta, A. R. North, & C. Brink.* 368, 585, 32-D4 (1991)
- NOTA, A. See MACCHETTO, F., et al. First Results from the Faint Object Camera: Observations of PKS 0521-36.
- See CRANE, P., et al. First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305.
- See JAKOBSEN, P., et al. First Results from the Faint Object Camera: SN 1987A.
- See PARESCHE, F., et al. First Results from the Faint Object Camera: Imaging the Core of R Aquarii.
- See MACCHETTO, F., et al. HST Observations of 3C 66B: A Double-stranded Optical Jet.
- See ALBRECHT, R., et al. First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System.
- See WEIGELT, G., et al. First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.
- NOUSEK, J. HEAO 1 A-2 Low-Energy Detector X-Ray Spectra of the Lupus Loop and SN 1006. *D. A. Leahy, J. Nousek, & A. J. S. Hamilton.* 374, 218, 100-G1 (1991)
- NOUSEK, JOHN A. Determination of Confidence Limits for Experiments with Low Numbers of Counts. *Ralph P. Kraft, David N. Burrows, & John A. Nousek.* 374, 344, 102-D1 (1991)
- NOVIKOV, B. See BARRET, D., et al. Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2.
- NOVIKOV, IGOR D. The Appearance of Highly Relativistic, Spherically Symmetric Stellar Winds. *Marek A. Abramowicz, Igor D. Novikov, & Bohdan Paczyński.* 369, 175, 38-B5 (1991)
- NOWAK, MICHAEL A. Diskoseismology: Probing Accretion Disks. I. Trapped Adiabatic Oscillations. *Michael A. Nowak & Robert V. Waggoner.* 378, 656, 160-E9 (1991)
- NOWAKOWSKI, LESZEK A. PSR 0540+23 Revised: Three Components, Drifting Subpulses, and Mode Switching. *Leszek A. Nowakowski.* 377, 581, 147-A1 (1991)
- NOYES, R. W. Formation of the Infrared Emission Lines of Mg I in the Solar Atmosphere. *E. S. Chang, E. H. Avrett, P. J. Mauas, R. W. Noyes, & R. Loeser.* 379, L79, 175-E1 (1991)
- NOYES, ROBERT W. Detection of Possible p-Mode Oscillations on Procyon. *Timothy M. Brown, Ronald L. Gilliland, Robert W. Noyes, & Lawrence W. Ramsey.* 368, 599, 32-E8 (1991)
- See DUNCAN, DOUGLAS K., et al. Ca II H and K Measurements Made at Mount Wilson Observatory, 1966-1983.
- NOZAWA, S. A Study of <sup>13</sup>CO Cloud Cores in Ophiuchus. *S. Nozawa, A. Mizuno, Y. Teshima, H. Ogawa, & Y. Fukui.* 77, 647, 53-E6 (1991)
- NÚÑEZ, L. The Evolution of Discontinuities in Radiating Spheres in the Diffusion Approximation. *W. Barreto, L. Herrera, & L. Núñez.* 375, 663, 121-A1 (1991)
- NUSSER, ADI. Cosmological Velocity-Density Relation in the Quasi-linear Regime. *Adi Nusser, Avishai Dekel, Edmund Bertschinger, & George R. Blumenthal.* 379, 6, 163-B7 (1991)
- NUTH, JOSEPH A. The SiH Vibrational Stretch as an Indicator of the Chemical State of Interstellar Grains. *Marta H. Moore, Toshihiko Tanabé, & Joseph A. Nuth.* 373, L31, 91-D7 (1991)
- O'CONNELL, ROBERT W. See BOHLIN, RALPH C., et al. Simulated Optical Images of Galaxies at  $z \sim 1$  Using Ultraviolet Images of Nearby Galaxies.
- O'DEA, C. P. What Are the Gigahertz Peaked-Spectrum Radio Sources? *C. P. O'Dea, S. A. Baum, & C. Stanghellini.* 380, 66, 176-G5 (1991)
- ODEGARD, NILS. A Nonthermal Radio Halo Surrounding M82. *E. R. Sequist & Nils Odegard.* 369, 320, 41-F13 (1991)
- O'DELL, C. R. New Ultraviolet Spectroscopic Features Found in Comet Borsoe-Metcalf (1989o). *C. R. O'Dell, Christopher O. Miller, Anita L. Cochran, William D. Cochran, Chet B. Opal, & Edwin S. Barker.* 368, 616, 32-G1 (1991)
- See HESTER, J. JEFF, et al. Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0''.1.
- O'DONOGHUE, D. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- OEGERLE, WILLIAM R. Fundamental Parameters of Brightest Cluster Galaxies. *William R. Oegerle & John G. Hoessel.* 375, 15, 111-B13 (1991)
- Dynamics of the Microwave-Decrement Cluster Abell 665. *William R. Oegerle, Michael J. Fitchett, John M. Hill, & Paul Hintzen.* 376, 46, 125-E10 (1991)
- Discovery of a Low-Redshift Ultraluminous "E+A" Galaxy. *William R. Oegerle, John M. Hill, & John G. Hoessel.* 381, L9, 194-B7 (1991)
- ÖZEL, MEHMET E. Cosmic-Ray Distribution and the Dynamic Balance in the Large Magellanic Cloud. *Carl E. Fichtel, Mehmet E. Öznel, Robert G. Stone, & P. Sreekumar.* 374, 134, 99-F7 (1991)
- O'FLAHERTY, K. S. See VACANTI, G., et al. Gamma-Ray Observations of the Crab Nebula at TeV Energies.
- See AKERLOF, C. W., et al. Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy.
- See REYNOLDS, P. T., et al. Search for TeV Gamma-Ray Emission from Hercules X-1.
- OGASAKA, Y.  $V/V_{\max}$  Test Applied to Ginga Gamma-Ray Bursts. *Y. Ogasaka, T. Murakami, J. Nishimura, A. Yoshida, & E. E. Fenimore.* 383, L61, 226-D6 (1991)
- OGATA, S. The Shear Modulus of the Neutron Star Crust and Nonradial Oscillations of Neutron Stars. *T. Strohmayer, S. Ogata, H. Iyetomi, S. Ichimaru, & H. M. Van Horn.* 375, 679, 121-B7 (1991)

- OGATA, SHUJI. Nuclear Reaction Rates in Dense Carbon-Oxygen Mixtures. *Shuji Ogata, Hiroshi Iyetomi, & Setsuo Ichimaru.* 372, 259, 77-B9 (1991)
- Thermonuclear Reactions in Dense Stellar Matter: Electron Screening Revisited. *Setsuo Ichimaru & Shuji Ogata.* 374, 647, 107-B5 (1991)
- OGAWA, H. A Study of  $^{13}\text{CO}$  Cloud Cores in Ophiuchus. *S. Nozawa, A. Mizuno, Y. Teshima, H. Ogawa, & Y. Fukui.* 77, 647, 53-E6 (1991)
- OGURA, KATSUO. A Catalog of Bright-rimmed Clouds with IRAS Point Sources: Candidates for Star Formation by Radiation-driven Implosion. I. The Northern Hemisphere. *Koji Sugitani, Yasuo Fukui, & Katsuo Ogura.* 77, 59, 44-B1 (1991)
- OHASHI, N. See KOYAMA, K., et al. An X-Ray Pulsar in the Direction of Molecular Cloud MBM 12 (Lynds 1457).
- OHASHI, NAGAYOSHI. Aperture Synthesis CS(2-1) Observations of a Young Stellar Object GL 490: Accretion Flow in Gas Disk. *Akiko Nakamura, Ryohi Kawabe, Yoshimi Kitamura, Masato Ishiguro, Yasuhiro Murata, & Nagayoshi Ohashi.* 383, L81, 226-F5 (1991)
- OHASHI, T. Ginga Observation of an AM Herculis Type Source H0538+608. *M. Ishida, A. Silber, H. V. Bradt, R. A. Remillard, K. Makishima, & T. Ohashi.* 367, 270, 15-D6 (1991)
- See KII, T., et al. X-Ray Continuum and Evidence for an Iron Emission Line from the Quasar E1821+643.
- Discovery of a Cyclotron Resonance Feature at 30 keV from the Transient X-Ray Pulsar Cepheus X-4. *T. Mihara, K. Makishima, S. Kamijo, T. Ohashi, F. Nagase, Y. Tanaka, & K. Koyama.* 379, L61, 175-C6 (1991)
- See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- OHASHI, Y. See MURAKI, Y., et al. Observations of Ultra-High-Energy Photons from Cygnus X-3.
- OHISHI, MASATOSHI. Detection of a New Carbon-Chain Molecule, CCO. *Masatoshi Ohishi, Hiroko Suzuki, Shin-ichi Ishikawa, Chikashi Yamada, Hideki Kanamori, William M. Irvine, Ronald D. Brown, Peter D. Godfrey, & Norio Kajii.* 380, L39, 181-E11 (1991)
- OHSAKI, T. See NAGAI, Y., et al. Capture Rate of the  $^7\text{Li}(n, \gamma)^8\text{Li}$  Reaction by Prompt Gamma-Ray Detection.
- OHSHIMA, YASUHIRO. Laboratory Detection of  $\text{HC}_9\text{N}$  Using a Fourier Transform Microwave Spectrometer. *Minoru Jida, Yasuhiro Ohshima, & Yasuki Endo.* 371, L45, 66-F7 (1991)
- OKA, TAKESHI. A Table of Astronomically Important Ro-vibrational Transitions for the  $\text{H}_3^+$  Molecular Ion. *Lancelot Kao, Takeshi Oka, Steven Miller, & Jonathan Tennyson.* 77, 317, 48-E1 (1991)
- Laboratory Infrared Spectra of  $\text{CH}_2\text{D}^+$  and  $\text{HCCD}^+$  and Predicted Microwave Transitions. *Mathias Rösslein, Mary-Frances Jagod, Charles M. Gabrys, & Takeshi Oka.* 382, L51, 205-F1 (1991)
- OKADA, A. See MURAKI, Y., et al. Observations of Ultra-High-Energy Photons from Cygnus X-3.
- OKAMURA, S. The Distance to the Coma Cluster Using the B-Band Tully-Fisher Relation. *M. Fukugita, S. Okamura, K. Tarusawa, H. J. Rood, & B. A. Williams.* 376, 8, 125-B9 (1991)
- OKAYASU, R. X-Ray and Radio Pulse Phase Comparison for PSR 1509-58. *N. Kawai, R. Okayasu, W. Brinkmann, R. Manchester, A. G. Lyne, & N. D'Amico.* 383, L65, 226-D12 (1991)
- OKOYE, S. E. The Confinement and Cosmological Evolution of Extragalactic Radio Source Components. *A. A. Ubachukwu, S. E. Okoye, & L. I. Onuora.* 383, 56, 212-F7 (1991)
- OKUDA, HARUYUKI. See SHIBAI, HIROSHI, et al. Large-Scale [C II] 158 Micron Emission from the Galaxy.
- OKUMURA, SACHIKO K. A Finger-like Extension of the 20 Kilometer per Second Cloud toward the Galactic Center. *Sachiko K. Okumura, Masato Ishiguro, Edward B. Fomalont, Tetsuo Hasegawa, Takashi Kasuga, Koh-Ichiro Morita, Ryohi Kawabe, & Hideyuki Kobayashi.* 378, 127, 152-E9 (1991)
- OLIVE, J. F. See MASSARO, E., et al. Detection of a Feature at 0.44 MeV in the Crab Pulsar Spectrum with FIGARO II: A Redshifted Positron Annihilation Line?
- OLIVE, KEITH A. Primordial Nucleosynthesis Redux. *Terry P. Walker, Gary Steigman, David N. Schramm, Keith A. Olive, & Ho-Shik Kang.* 376, 51, 125-F1 (1991)
- The Upper Bound to the Primordial Abundance of Helium and the Consistency of the Hot Big Bang Model. *Keith A. Olive, Gary Steigman, & Terry P. Walker.* 380, L1, 181-B1 (1991)
- OLIVEIRA, C. L. M. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- OLIVERSEN, R. J. Observations of the Peculiar Object MWC 560 in Outburst. *A. G. Michalitsianos, S. P. Maran, R. J. Olofsson, B. Bopp, E. Konizas, A. Dapergolas, & M. Kontizas.* 371, 761, 71-A7 (1991)
- Ultraviolet and Optical Spectroscopy of the R Aquarii Symmetrical Jet. *J. M. Hollis, R. J. Olofsson, M. Kafatos, A. G. Michalitsianos, & R. M. Wagner.* 377, 227, 140-F11 (1991)
- OLOFSSON, H. Abundances in Red Giant Stars: Nitrogen Isotopes in Carbon-rich Molecular Envelopes. *P. G. Wannier, B-G Andersson, H. Olofsson, N. Ukita, & K. Young.* 380, 593, 185-E8 (1991)
- ONAKA, TAKASHI. Vacuum Ultraviolet Imagery of the Virgo Cluster Region. III. Diffuse Far-Ultraviolet Radiation at High Galactic Latitudes. *Takashi Onaka & Keiichi Kodaira.* 379, 532, 171-C5 (1991)
- O'NEIL, EARL J., JR. See LYNDS, ROGER, et al. NGC 1068: Resolution of Nuclear Structure in the Optical Continuum.
- See HOLTZMAN, JON A., et al. Stellar Photometry with the *Hubble Space Telescope* Wide-Field/Planetary Camera: A Progress Report.
- See LAUER, TOD R., et al. The Core of the Nearby S0 Galaxy NGC 7457 Imaged with the *HST* Planetary Camera.
- See LAUER, TOD R., et al. The Postcollapse Core of M15 Imaged with the *HST* Planetary Camera.
- See WESTPHAL, JAMES A., et al. *Hubble Space Telescope* Wide-Field/Planetary Camera Images of Saturn.
- See HESTER, J. JEFF, et al. Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0''.1.
- ONELLO, J. S. Radio Recombination Lines from Diffuse Interstellar Gas in the Galaxy. *J. C. Cersosimo & J. S. Onello.* 370, 225, 50-A5 (1991)
- ONELLO, JOSEPH S. High-Resolution Spectroscopy of Partially Ionized Gas around H II Regions. *Joseph S. Onello, J. A. Phillips, & Yervant Terzian.* 383, 693, 222-G6 (1991)
- ONUORA, L. I. Radio Source Orientation and the Angular Diameter-Redshift Relation. *L. I. Onuora.* 377, 36, 138-E1 (1991)
- The Confinement and Cosmological Evolution of Extragalactic Radio Source Components. *A. A. Ubachukwu, S. E. Okoye, & L. I. Onuora.* 383, 56, 212-F7 (1991)
- OPAL, CHET B. New Ultraviolet Spectroscopic Features Found in Comet Borrsen-Metcalf (1989). *C. R. O'Dell, Christopher O. Miller, Anita L. Cochran, William D. Cochran, Chet B. Opal, & Edwin S. Barker.* 368, 616, 32-G1 (1991)
- OPHER, R. Collapse of Population III Objects Induced by Cold Collisionless Dark Matter. *J. C. N. de Araujo & R. Opher.* 379, 461, 170-D10 (1991)
- ORMES, J. F. Measurement of Cosmic-Ray Proton and Helium Spectra during the 1987 Solar Minimum. *E. S. Seo, J. F. Ormes, R. E. Streitmatter, S. J. Stochaj, W. V. Jones, S. A. Stephens, & T. Bowen.* 378, 763, 161-G1 (1991)
- A Measurement of the Cosmic-Ray  $^2\text{H}$  and  $^3\text{He}$  Spectra and  $^2\text{H}/^4\text{He}$  and  $^3\text{He}/^4\text{He}$  Ratios in 1989. *W. R. Webber, R. L. Golden, S. J. Stochaj, J. F. Ormes, & R. E. Streitmatter.* 380, 230, 178-G9 (1991)
- ORRALL, F. Q. Submillimeter Solar Limb Profiles Determined from Observations of the Total Solar Eclipse of 1988 March 18. *T. L. Roellig, E. E. Becklin, J. T. Jefferies, G. A. Kopp, C. A. Lindsey, F. Q. Orrall, & M. W. Werner.* 381, 288, 192-E5 (1991)
- ORRALL, FRANK Q. Systematic Radial Flows in the Chromosphere, Transition Region, and Corona of the Quiet Sun. *Donald M. Hassler, Gary J. Rottman, & Frank Q. Orrall.* 372, 710, 84-E1 (1991)
- ORTOLANI, S. Metal-rich Giant Branches of Bulge Clusters: Application to Color-Magnitude Diagrams of M31 and M32. *E. Bica, Barbuy, & S. Ortolani.* 382, L15, 205-B12 (1991)
- ORWIG, L. E. SMM/HXRBS Observations of Cygnus X-1 from 1986 December to 1988 April. *R. A. Schwartz, L. E. Orwig, B. R. Dennis, J. C. Ling, & W. A. Wheaton.* 376, 312, 128-G1 (1991)

- OSAKI, Y. Characteristics of Intermediate-Degree Solar  $p$ -Mode Line Widths. *S. M. Jeffries, T. L. Duvall, Jr., J. W. Harvey, Y. Osaki, & M. A. Pomerantz.* 377, 330, 142-A11 (1991)
- OSMER, PATRICK S. A New Survey for Quasar Clustering. *Patrick S. Osmer & Paul C. Hewett.* 75, 273, 4-E9 (1991)
- A Wide-Field Multicolor Survey for High-Redshift Quasars,  $z \geq 2.2$ . I. Photometric Catalog and Survey Selection Function. *Stephen J. Warren, Paul C. Hewett, Michael J. Irwin, & Patrick S. Osmer.* 76, 1, 24-B1 (1991)
- A Wide-Field Multicolor Survey for High-Redshift Quasars,  $z \geq 2.2$ . II. The Quasar Catalog. *Stephen J. Warren, Paul C. Hewett, & Patrick S. Osmer.* 76, 23, 24-D3 (1991)
- OSTRIKER, EVE C. Isothermal, Compton-heated Coronae above Accretion Disks. *Eve C. Ostriker, Christopher F. McKee, & Richard I. Klein.* 377, 593, 147-B3 (1991)
- OSTRIKER, J. P. A Hydrodynamic Approach to Cosmology: Texture-seeded Cold Dark Matter and Hot Dark Matter Cosmogonies. *R. Y. Cen, J. P. Ostriker, D. N. Spergel, & N. Turok.* 383, 1, 212-B1 (1991)
- OSTRIKER, JEREMIAH P. Expansion-cooled Lyman-Alpha Clouds. *Robert C. Duncan, Ethan T. Vishniac, & Jeremiah P. Ostriker.* 368, L1, 28-B1 (1991)
- Lyman-Alpha Depression of the Continuum from High-Redshift Quasars: A New Technique Applied in Search of the Gunn-Peterson Effect. *Edward B. Jenkins & Jeremiah P. Ostriker.* 376, 33, 125-D9 (1991)
- The Velocity Dispersion of Giant Molecular Clouds. II. Mathematical and Numerical Refinements. *Charles F. Gammie, Jeremiah P. Ostriker, & Chanda J. Jog.* 378, 565, 159-D5 (1991)
- OTT, HEINZ-ALBERT. Scales of Structures and Homogeneity in the Universe. *Peter Schuecker & Heinz-Albert Ott.* 378, L1, 157-A7 (1991)
- OWEN, FRAZER N. The Extraordinary Radio Source 3C 442. *Neil F. Comins & Frazer N. Owen.* 382, 108, 201-E1 (1991)
- OWOCKI, S. P. Instabilities in Line-driven Stellar Winds. V. Effect of an Optically Thick Continuum. *S. P. Owocki & G. R. Rybicki.* 368, 261, 26-C11 (1991)
- The Effect of Viscosity on Steady Transonic Flow with a Nodal Solution Topology. *S. P. Owocki & G. P. Zank.* 368, 491, 31-C1 (1991)
- OZERNOY, L. M. The Galactic Center Radio Source Shines below the Compton Limit. *C. R. Gwinn, R. M. Danen, J. Middleditch, L. M. Ozernoy, & T. K. Tran.* 381, L43, 199-B7 (1991)
- PACHECO, J. A. F. Diffusion Processes in the Collapse of a Radiating Spherical Body. *R. Chan, L. Herrera, J. A. F. Pacheco, & N. O. Santos.* 382, 255, 203-D1 (1991)
- PACZYNSKI, B. Gravitational Microlensing of the Galactic Bulge Stars. *B. Paczyński.* 371, L63, 73-C4 (1991)
- Gamma-Ray Bursts from Colliding Strange Stars. *P. Haensel, B. Paczyński, & P. Amsterdam.* 375, 209, 113-E10 (1991)
- PACZYNSKI, BOHDAN. Bursts of Gamma Rays from Compton Scattering at Cosmological Distances. *Andrzej Zdziarski, Roland Svensson, & Bohdan Paczyński.* 366, 343, 7-B3 (1991)
- The Appearance of Highly Relativistic, Spherically Symmetric Stellar Winds. *Marek A. Abramowicz, Igor D. Novikov, & Bohdan Paczyński.* 369, 175, 38-B5 (1991)
- A Polytropic Model of an Accretion Disk, a Boundary Layer, and a Star. *Bohdan Paczyński.* 370, 597, 55-G11 (1991)
- Gravitational Microlensing by Double Stars and Planetary Systems. *Shude Mao & Bohdan Paczyński.* 374, L37, 110-B11 (1991)
- PADMAN, R. Far-Infrared and Submillimeter Wavelength Observations of Star-forming Dense Cores. II. Images. *E. F. Ladd, Fred C. Adams, S. Casey, J. A. Davidson, G. A. Fuller, D. A. Harper, P. C. Myers, & R. Padman.* 382, 555, 208-D7 (1991)
- PADOVANI, P. Fanaroff-Riley I Galaxies as the Parent Population of BL Lacertae Objects. II. Optical Constraints. *P. Padovani & C. M. Urry.* 368, 373, 29-F6 (1991)
- Altered Luminosity Functions for Relativistically Beamed Objects. II. Distribution of Lorentz Factors and Parent Populations with Complex Luminosity Functions. *C. M. Urry & P. Padovani.* 371, 60, 60-G5 (1991)
- The Complete Sample of 1 Jansky BL Lacertae Objects. I. Summary Properties. *M. Stickel, P. Padovani, C. M. Urry, J. W. Fried, & H. Kühl.* 374, 431, 104-E1 (1991)
- Fanaroff-Riley I Galaxies as the Parent Population of BL Lacertae Objects. III. Radio Constraints. *C. M. Urry, P. Padovani, & M. Stickel.* 382, 501, 207-F13 (1991)
- PAERELS, FRITS B. S. On the X-Ray-emitting Boundary Layer of the Dwarf Nova VW Hydri. *Christopher W. Mauche, Richard A. Wade, Ronald S. Polidan, Hans van der Woerd, & Frits B. S. Paerels.* 372, 659, 83-G7 (1991)
- Brown Fluorescence in AM Herculis Stars. *Jonathan Schachter, Alexei V. Filippenko, Steven M. Kahn, & Frits B. S. Paerels.* 373, 633, 95-G4 (1991)
- PAGANI, L. See WANNIER, P. G., et al. Water in Dense Molecular Clouds.
- PAGE, DANY. Strangeness Condensation, Nucleon Superfluidity, and Cooling of Neutron Stars: Erratum. *Dany Page & E. Baron.* 382, L111, 211-F12 (1991) (Orig. paper in 354, L17, 80-C1 (1990))
- PAGE, LYMAN A. A Measurement of the Large-Scale Cosmic Microwave Background Anisotropy at 1.8 Millimeter Wavelength. *Stephen S. Meyer, Edward S. Cheng, & Lyman A. Page.* 371, L7, 66-B3 (1991)
- PALEY, ELIZABETH S. An Infrared/Optical Investigation of 100 Micron "Cirrus." *Elizabeth S. Paley, Frank J. Low, John T. McGraw, Roc M. Cutri, & Hans-Walter Rix.* 376, 335, 129-A13 (1991)
- PALLA, FRANCESCO. The Evolution of Intermediate-Mass Protostars. I. Basic Results. *Francesco Palla & Steven W. Stahler.* 375, 288, 114-E1 (1991)
- PALLAVICINI, ROBERTO. Numerical Simulations of Flares on M Dwarf Stars. I. Hydrodynamics and Coronal X-Ray Emission. *Chung-Chieh Cheng & Roberto Pallavicini.* 381, 234, 191-G12 (1991)
- PALMER, DAVID M. Coded-Aperture Imaging of the Galactic Center Region at Gamma-Ray Energies. *Walter R. Cook, John M. Grunsfeld, William A. Heindl, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone.* 372, L75, 85-D1 (1991)
- PANAGIA, N. See JAKOBSEN, P., et al. First Results from the Faint Object Camera: SN 1987A.
- Properties of the SN 1987A Circumstellar Ring and the Distance to the Large Magellanic Cloud. *N. Panagia, R. Gilmozzi, F. Macchietto, H.-M. Adorf, & R. P. Kirshner.* 380, L23, 181-D1 (1991)
- PANAGIA, NINO. The 10 Year Radio Light Curves for SN 1979C. *Kurt W. Weiler, Schuyler D. Van Dyk, Nino Panagia, Richard A. Sramek, & Jennifer L. Discenna.* 380, 161, 178-B1 (1991)
- PANASYUK, M. I. See ADAMS, J. H., JR., et al. The Charge State of the Anomalous Component of Cosmic Rays.
- PANDE, L. K. On Solar Emission Lines. *G. P. Malik, L. K. Pande, & Vijaya S. Varma.* 379, 788, 174-E1 (1991)
- PAPALIOLIOS, C. Asymmetries in the Atmosphere of Mira. *M. Karovska, P. Nisenson, C. Papaliolios, & R. P. Boyle.* 374, L51, 110-D1 (1991)
- PARDO, F. Flares Observed by the Normal Incidence X-Ray Telescope on 1989 September 11. *M. Herant, F. Pardo, E. Spiller, & L. Golub.* 376, 797, 136-C6 (1991)
- PARESC, F. See MACCHETTO, F., et al. First Results from the Faint Object Camera: Observations of PKS 0521-36.
- See CRANE, P., et al. First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305.
- See JAKOBSEN, P., et al. First Results from the Faint Object Camera: SN 1987A.
- First Results from the Faint Object Camera: Imaging the Core of R Aquarii. *F. Paresce, R. Albrecht, C. Barbieri, J. C. Blades, A. Bokkenberg, P. Crane, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kamperman, I. R. King, F. Macchietto, C. D. Mackay, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, & W. B. Sparks.* 369, L67, 46-B7 (1991)
- See MACCHETTO, F., et al. HST Observations of 3C 66B: A Double-stranded Optical Jet.
- See ALBRECHT, R., et al. First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System.
- See WEIGELT, G., et al. First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.

- PARESCHE, FRANCESCO. Narrow-Band Imaging of the Inner R Aquari Nebula: Further Evidence for Shock Excitation. *Denis Burgarella & Francesco Paresce*. 370, 590, 55-G1 (1991)
- PARK, CHANGBOM. Large-Scale Structure in a Texture-seeded Cold Dark Matter Cosmogony. *Changbom Park, David N. Spergel, & Neil Turok*. 372, L53, 85-B1 (1991)
- Dynamical Evolution of Topology of Large-Scale Structure. *Changbom Park & J. Richard Gott III*. 378, 457, 158-B1 (1991)
- Constraints on Cosmological Models from the IRAS QDOT Survey Results. *Changbom Park*. 382, L59, 211-B1 (1991)
- The Three-Point Correlation Function for Abell Clusters: Observations and Simulations. *J. Richard Gott III, Bin Gao, & Changbom Park*. 383, 90, 213-B10 (1991)
- PARK, HYE-SOOK. See GRIEST, KIM, et al. Gravitational Microlensing as a Method of Detecting Disk Dark Matter and Faint Disk Stars.
- PARK, MYEONG-GU. Near-critical Spherical Accretion by Neutron Stars: General Relativistic Treatment. *Myeong-Gu Park & Guy S. Miller*. 371, 708, 70-D1 (1991)
- PARK, SEOK JAE. Are Hypernovae Detectable? *Seok Jae Park & Ethan T. Vishniac*. 375, 565, 119-F9 (1991)
- PARKER, E. N. Heating Solar Coronal Holes. *E. N. Parker*. 372, 719, 84-E1 (1991)
- The Phase Mixing of Alfvén Waves, Coordinated Modes, and Coronal Heating. *E. N. Parker*. 376, 355, 129-C11 (1991)
- Dynamical Buoyancy of Hydrodynamic Eddies. *E. N. Parker*. 380, 251, 179-B5 (1991)
- PARKINSON, W. H. High-Resolution Absorption Cross Sections of Carbon Monoxide Bands at 295 K between 91.7 and 100.4 Nanometers. *G. Stark, K. Yoshino, Peter L. Smith, K. Ito, & W. H. Parkinson*. 369, 574, 44-G13 (1991)
- PARLIER, B. See MASSARO, E., et al. Detection of a Feature at 0.44 MeV in the Crab Pulsar Spectrum with FIGARO II: A Redshifted Positron Annihilation Line?
- PARMAR, PARVINDER S. Detection of Low-J Pure-Rotational Emission from H<sub>2</sub> in the Orion Bar Region: Evidence for Small-Scale Clumpiness. *Parvinder S. Parmar, John H. Lacy, & Jeffrey M. Achtermann*. 372, L25, 79-D1 (1991)
- PARNELL, H. C. High-Resolution Spectroscopy of Q1100-264 Again. *R. F. Carswell, K. M. Lanzetta, H. C. Parnell, & J. K. Webb*. 371, 36, 60-E1 (1991)
- PATIÑO, ALBERTO. Irradiation of Accretion Disks around Young Objects. I. Near-Infrared CO Bands. *Nuria Calvet, Alberto Patiño, Gladis Magris C., & Paola D'Alessio*. 380, 617, 185-G8 (1991)
- PATTERSON, JOSEPH. A Search for Periodicities in the X-Ray Emission from Cataclysmic Variables. *Michael Eracleous, Joseph Patterson, & Jules Halpern*. 370, 330, 51-D1 (1991)
- The Infrared and Optical Pulsations of G29-38. *Joseph Patterson, B. Zuckerman, E. E. Becklin, D. J. Tholen, & T. Hawarden*. 374, 330, 102-C1 (1991)
- High-Speed Photometry of V404 Cygni in Outburst. *Eric Goethelf, Joseph Patterson, & Richard J. Stover*. 374, 340, 102-C11 (1991)
- X-Ray Spectra of Cataclysmic Variables from the Einstein Observatory. *Michael Eracleous, Jules Halpern, & Joseph Patterson*. 382, 290, 203-G1 (1991)
- PAUBERT, G. Astronomical Detection of H<sub>2</sub>CCC. *J. Cernicharo, C. A. Gottlieb, M. Guillet, T. C. Killian, G. Paubert, P. Thaddeus, & J. M. Vrilek*. 368, L39, 35-C7 (1991)
- PAUBERT, GABRIEL. First Absolute Wind Measurements in the Middle Atmosphere of Mars. *Emmanuel Lellouch, Jeffrey J. Goldstein, Stephen W. Bougher, Gabriel Paubert, & Jan Rosengqvist*. 383, 401, 217-C5 (1991)
- PAUL, J. See BOUCHET, L., et al. SIGMA Discovery of Variable e<sup>+</sup>-e<sup>-</sup> Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7-2942.
- See SUNYAEV, R., et al. Three Spectral States of 1E 1740.7-2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature.
- PAULDRACH, A. See HEAP, S. R., et al. First Results from the Goddard High-Resolution Spectrograph: Spectroscopic Determination of Stellar Parameters of Melnick 42, an O3f Star in the Large Magellanic Cloud.
- PAUZAT, F. Is Interstellar Detection of Higher Members of the Linear Radicals C<sub>n</sub>CH and C<sub>n</sub>N Feasible? *F. Pauzat, Y. Ellinger, & A. D. McLean*. 369, L13, 40-B11 (1991)
- PAVLINSKY, M. See BOUCHET, L., et al. SIGMA Discovery of Variable e<sup>+</sup>-e<sup>-</sup> Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7-2942.
- See SUNYAEV, R., et al. Three Spectral States of 1E 1740.7-2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature.
- PAVLOV, G. G. Radiative Widths and Splitting of Cyclotron Lines in Superstrong Magnetic Fields. *G. G. Pavlov, V. G. Bezhastov, P. Mészáros, & S. G. Alexander*. 380, 541, 185-A1 (1991)
- PAZDER, JOHN. Diameters of Galactic Globular Clusters. *Sidney van den Bergh, Christopher Morley, & John Pazder*. 375, 594, 120-B1 (1991)
- PEACOCK, J. A. Power-Spectrum Analysis of One-dimensional Redshift Surveys. *N. Kaiser & J. A. Peacock*. 379, 482, 170-F5 (1991)
- PEARSON, J. C. Millimeter- and Submillimeter-Wave Spectrum of Highly Excited States of Water. *J. C. Pearson, Todd Anderson, Eric Herbst, Frank C. De Lucia, & Paul Helminger*. 379, L41, 169-D12 (1991)
- PEDERSEN, BRIAN B. On Equation of State Interpolation Errors in Stellar Interior Calculations. *Ben Dorman, Alan W. Irwin, & Brian B. Pedersen*. 381, 228, 191-G4 (1991)
- PEI, YICHUAN C. Confirmation of Dust in Damped Lyman-Alpha Systems. *Yichuan C. Pei, S. Michael Fall, & Jill Bechtold*. 378, 6, 151-B4 (1991)
- PELETTIER, R. F. Infrared Images, Virgo Spirals, and the Tully-Fisher Law. *R. F. Peletier & S. P. Willner*. 382, 382, 206-C13 (1991)
- PELLAT, R. Precollapse Scale Invariance in Gravitational Instability. *F. Moutarde, J.-M. Alimi, F. R. Bouchet, R. Pellat, & A. Ramani*. 382, 377, 206-C5 (1991)
- PELLEGRINI, PAULO S. Southern Sky Redshift Survey: The Catalog. *L. Nicolaci da Costa, Paulo S. Pellegrini, Marc Davis, Avery Meiksin, Wallace L. W. Sargent, & John L. Tonry*. 75, 935, 15-B1 (1991)
- PELLEGRINI, SILVIA. Winds, Outflows, and Inflows in X-Ray Elliptical Galaxies. I. *Luca Ciotti, Annibale D'Ercole, Silvia Pellegrini, & Alvio Renzini*. 376, 380, 131-B12 (1991)
- PELLETIER, G. Oblique Mixed Shocks in Extragalactic Jets. *D. Fraix-Burnet & G. Pelletier*. 367, 86, 13-B1 (1991)
- PELLETIER, GUY. Relativistic Electron-Positron Beam Formation in the Framework of the Two-Flow Model for Active Galactic Nuclei. *Gilles Henri & Guy Pelletier*. 383, L7, 219-B1 (1991)
- PELLÓ, ROSER. A Straight Gravitational Image in Abell 2390: A Striking Case of Lensing by a Cluster of Galaxies. *Roser Pelló, Jean-François Le Borgne, Geneviève Soucail, Yannick Mellier, & Blai Sanahuja*. 366, 405, 7-G9 (1991)
- PENDLETON, Y. The Interstellar C-H Stretching Band near 3.4 Microns: Constraints on the Composition of Organic Material in the Diffuse Interstellar Medium. *S. A. Sandford, L. J. Allamandola, A. G. G. M. Tielens, K. Sellgren, M. Tapia, & Y. Pendleton*. 371, 607, 69-B1 (1991)
- PENSTON, M. V. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- PENG, WEI. Analysis of C IV Absorption Lines from Clouds at High Redshifts. *Wei Peng & Jon C. Weisheit*. 373, 471, 93-G4 (1991)
- PENNINK, W. See TAN, J., et al. Changes in the 11 Minute Period of 4U 1820-30.
- Observations of Scorpius X-1 with IUE: Ultraviolet Results from a Multiwavelength Campaign. *S. D. Vrilek, W. Penninx, J. C. Raymond, F. Verbunt, P. Hertz, K. Wood, W. H. G. Lewin, & K. Mitsuda*. 376, 278, 128-D1 (1991)
- See WOOD, K. S., et al. Searches for Millisecond Pulsations in Low-Mass X-Ray Binaries.
- PENSTON, M. V. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- The Ultraviolet Spectrum of NGC 4151 from 1978 to 1990: General Characteristics and Evolution. *M.-H. Ulrich, A. Boksenberg, G. E.*

- Bromage, J. Clavel, A. Elvius, M. V. Penston, G. C. Perola, & M. A. J. Snijders. 382, 483, 207-E7 (1991)
- PENTLAND, G. See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- PERAIAH, A. Aberration and Advection Effects in Expanding Spherically Symmetric Shells. *A. Peraiah*. 371, 673, 70-A1 (1991)
- Effects of Aberration and Advection on Line Formation. *A. Peraiah*. 380, 212, 178-F1 (1991)
- PERCY, JOHN R. Period Changes and Evolution in RV Tauri Stars. *John R. Percy, Dimitar D. Sasselov, Amy Alfred, & Greg Scott*. 375, 691, 121-C7 (1991)
- PERELMUTER, JEAN-MARC. The Surface Brightness Test for the Expansion of the Universe. III. Reduction of Data for the Several Brightest Galaxies in Clusters to Standard Conditions and a First Indication That the Expansion Is Real. *Allan Sandage & Jean-Marc Perelmutter*. 370, 455, 54-B1 (1991)
- PEREZ, CHRISTOPHER A. Continuum Opacity Produced by Spectral Lines in Supernovae and Similar Explosions. *Robert V. Wagoner, Christopher A. Perez, & Mary Vasu*. 377, 639, 147-E12 (1991)
- PÉREZ, E. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- PÉREZ, M. See HUTCHINGS, J. B., et al. First Results from the Goddard High-Resolution Spectrograph: Ultraviolet Spectra of a Starburst Knot in NGC 1068.
- PÉREZ, MARIO R. A Cool Supergiant with Anomalous Behavior of the 2800 Mg II Doublet. *G. A. Gurzadyan, Y. Kondo, S. S. Rustambekyan, Yervant Terzian, & Mario R. Perez*. 378, 298, 154-F1 (1991)
- PERIALE, L. See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- PERINOTTO, M. Chemical Abundances in Planetary Nebulae: Basic Data and Correlations between Elements. *M. Perinotto*. 76, 687, 34-C9 (1991)
- PERKINS, SAM P. Gravitational Clustering in the Expanding Universe: Controlled High-Resolution Studies in Two Dimensions. *John Francis Beacon, Kurt G. Dominik, Adrian L. Melott, Sam P. Perkins, & Sergei F. Shandarin*. 372, 351, 80-B7 (1991)
- PERLEY, R. Relativistic Electron Populations in Cassiopeia A. *M. Anderson, L. Rudnick, P. Leppik, R. Perley, & R. Braun*. 373, 146, 87-G4 (1991)
- PERLEY, R. A. Multifrequency Radio Observations of Cygnus A: Spectral Aging in Powerful Radio Galaxies. *C. L. Carilli, R. A. Perley, J. W. Dreher, & J. P. Leahy*. 383, 554, 221-B9 (1991)
- PERLMUTTER, SAUL. See GRIEST, KIM, et al. Gravitational Microlensing as a Method of Detecting Disk Dark Matter and Faint Disk Stars.
- PEROLA, G. C. The Ultraviolet Spectrum of NGC 4151 from 1978 to 1990: General Characteristics and Evolution. *M.-H. Ulrich, A. Boksenberg, G. E. Bromage, J. Clavel, A. Elvius, M. V. Penston, G. C. Perola, & M. A. J. Snijders*. 382, 483, 207-E7 (1991)
- PEROTTI, F. See UBERTINI, P., et al. "Superlow-State" Hard X-Ray Observation of Cygnus X-1.
- See BAZZANO, A., et al. Hard X-Rays from Coma Cluster Region: Erratum.
- Hard X-Ray Variability of NGC 4151. *F. Perotti, P. Maggioli, E. Quadrini, A. Bazzano, P. Ubertini, L. Bassani, J. B. Stephen, A. J. Court, A. J. Dean, N. A. Dipper, & R. A. Lewis*. 373, 75, 87-A1 (1991)
- Low-Flux Hard X-Ray Observation of Cygnus X-1. *P. Ubertini, A. Bazzano, C. La Padula, R. K. Manchanda, V. F. Polcaro, R. Stauber, E. Kendziorra, & F. Perotti*. 383, 263, 215-D9 (1991)
- PERSIC, M. Small-Scale Fluctuations and Angular Correlations of the X-Ray Background in the HEAO 1 A-2 Energy Band: Constraints on Clustering of X-Ray Sources. *J. M. Martin-Morales, G. De Zotti, E. A. Boldi, F. E. Marshall, L. Danese, A. Franceschini, & M. Persic*. 379, 507, 171-A4 (1991)
- PERSIC, MASSIMO. The Universal Galaxy Rotation Curve. *Massimo Persic & Paolo Salucci*. 368, 60, 23-G9 (1991)
- Background Correlation Functions from Galaxy Rotation Curves. *Stefano Borgani, Silvio A. Bonometto, Massimo Persic, & Paolo Salucci*. 374, 20, 98-C7 (1991)
- The Dark Matter Content of Spiral Galaxies. *Paolo Salucci, Keith M. Ashman, & Massimo Persic*. 379, 89, 164-B1 (1991)
- X-Ray Emission from Starburst Galaxies. *Yoel Rephaeli, Duane Gruber, Massimo Persic, & Dan MacDonald*. 380, L59, 188-C1 (1991)
- PERSSON, S. E. The Appearance of a New Redshift System in Markarian 231. *Todd A. Boroson, Karie A. Meyers, Simon L. Morris, & S. E. Persson*. 370, L19, 53-D1 (1991)
- PESCH, PETER. The Case Low-Dispersion Northern Sky Survey. XII. A Region in Southern Canes Venatici. *Peter Pesch, N. Sanduleak, & C. B. Stephenson*. 76, 1043, 40-B1 (1991)
- PETERS, GERALDINE J. Circumstellar Material around  $\lambda$  Eridani (B2e). I. Geometry and Kinematics during 1987-1988. *Myron A. Smith, Geraldine J. Peters, & C. A. Grady*. 367, 302, 15-G1 (1991)
- PETERSON, B. M. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths. *B. M. Peterson, T. J. Balonek, E. S. Barker, J. Bechtold, R. Bertram, N. G. Bochkarev, M. J. Bolte, D. Bond, T. A. Boroson, M. T. Carini, T. E. Carone, J. A. Christensen, S. D. Clements, A. L. Cochran, R. D. Cohen, D. Crampton, M. Dietrich, M. Elvis, A. Ferguson, A. V. Filippenko, K. J. Fricke, C. M. Gaskell, J. P. Halpern, J. P. Huchra, J. B. Hutchings, W. Kollatschny, A. P. Koratkar, K. T. Korista, J. H. Krolik, N. J. Lane, A. Laor, R. J. Leacock, G. M. MacAlpine, M. A. Malkan, D. Maoz, H. R. Miller, S. L. Morris, H. Netzer, C. L. M. Oliveira, J. Penfold, M. V. Penston, E. Pérez, R. W. Pogge, M. W. Richmond, W. Romanishin, E. I. Rosenblatt, L. Saddlemeyer, A. Sadun, S. R. Sawyer, J. C. Shields, A. I. Shapovalova, A. G. Smith, H. A. Smith, P. S. Smith, W.-H. Sun, U. Thiele, T. J. Turner, S. Veilleux, R. M. Wagner, R. J. Weymann, B. J. Wilkes, B. J. Wills, D. Wills, & P. F. Younger*. 368, 119, 24-E3 (1991)
- PETERSON, BRADLEY M. Echo Mapping of Broad H $\beta$  Emission in NGC 5548. *Keith Horne, William F. Welsh, & Bradley M. Peterson*. 367, L5, 17-B10 (1991)
- On the Size of the Broad-Line Region in Arakelian 120. *Bradley M. Peterson & C. Marin Gaskell*. 368, 152, 25-A1 (1991)
- Physical Conditions in the Orion Nebula and an Assessment of Its Helium Abundance. *Jack A. Baldwin, Gary J. Ferland, P. G. Martin, Michael R. Corbin, Stephen A. Cota, Bradley M. Peterson, & Arne Slettebak*. 374, 580, 106-D1 (1991)
- PETERSON, BRUCE A. Faint Galaxies: Bounds on the Epoch of Galaxy Formation and the Cosmological Deceleration Parameter. *Yuzuru Yoshi & Bruce A. Peterson*. 372, 8, 74-B6 (1991)
- See GRIEST, KIM, et al. Gravitational Microlensing as a Method of Detecting Disk Dark Matter and Faint Disk Stars.
- PETERSON, J. B. Gravitational Lens Interference. *J. B. Peterson & Toby Falk*. 374, L5, 103-C1 (1991)
- PETRE, ROBERT. An Infrared Analysis of Puppis A. *Richard G. Arendt, Eli Dwek, & Robert Petre*. 368, 474, 31-A7 (1991)
- PETROSIAN, VAHE. Evolution of the Luminosity Function of Quasar Accretion Disks. *David M. Caditz, Vahé Petrosian, & Amri Wandell*. 372, L63, 85-C1 (1991)
- Center-to-Limb Variations of Characteristics of Solar Flare Hard X-Ray and Gamma-Ray Emission. *James M. McTiernan & Vahé Petrosian*. 379, 381, 167-F11 (1991)
- PETTERSEN, BJØRN R. The Great Flare of 1985 April 12 on AD Leonis. *Suzanne L. Hawley & Bjørn R. Petersen*. 378, 725, 161-D1 (1991)
- PETTERSON, J. A. A Model for the 35 Day Variations in the Pulse Profile of Hercules X-1. *J. A. Pettersson, R. E. Rothschild, & D. E. Gruber*. 378, 696, 161-A11 (1991)
- PETUCHOWSKI, S. J. A Search for vibrationally excited H<sub>2</sub>O at 68 GHz. *S. J. Petuchowski & C. L. Bennett*. 367, 168, 14-B4 (1991)
- PHILLIPS, ANDREW C. A Study of Star Formation in the Disks of Sa Galaxies. *Nelson Caldwell, Robert Kennicutt, Andrew C. Phillips, & Robert A. Schommer*. 370, 526, 54-G12 (1991)
- PHILLIPS, J. A. Pulsar Timing at Low Radio Frequencies: Evidence for Superdispersion? *J. A. Phillips*. 373, L63, 97-D11 (1991)
- Time Variability of Pulsar Dispersion Measures. *J. A. Phillips & A. Wolszczan*. 382, L27, 205-D1 (1991)
- High-Resolution Spectroscopy of Partially Ionized Gas around H II Regions. *Joseph S. Onello, J. A. Phillips, & Yervant Terzian*. 383, 693, 222-G6 (1991)

- PHILLIPS, K. J. H. The Iron-to-Calcium Abundance Ratio in the 20 x 10<sup>6</sup> K Plasma of Medium and Large Solar Flares. *K. J. H. Phillips & U. Feldman*. 379, 401, 168-A5 (1991)
- PHILLIPS, M. M. The Evolution and Classification of Postoutburst Novae Spectra. *R. E. Williams, M. Hamuy, M. M. Phillips, S. R. Heathcote, Lisa Wells, & M. Navarrete*. 376, 721, 135-C7 (1991)
- PHILLIPS, MARK M. Premaximum Observations of the Type Ia SN 1990N. *Bruno Leibundgut, Robert P. Kirshner, Alexei V. Filippenko, Joseph C. Shields, Craig B. Foltz, Mark M. Phillips, & George Sonneborn*. 371, L23, 66-D1 (1991)
- PHILLIPS, R. B. Millisecond Radio Structure of Weak-lined T Tauri Stars. *R. B. Phillips, C. J. Lonsdale, & E. D. Feigelson*. 382, 261, 203-D9 (1991)
- PHILLIPS, ROBERT B. Direct VLBI Detection of the Magnetosphere Surrounding the Young Star S1 in  $\rho$  Ophiuchi. *Philippe André, Robert B. Phillips, Jean-François Lestrade, & Karl-Ludwig Klein*. 376, 630, 134-B12 (1991)
- PHILLIPS, T. G. Protostellar Condensations in the Core of NGC 2024. *D. C. Lis, J. E. Carlstrom, & T. G. Phillips*. 370, 583, 55-F5 (1991)
- The Edges of Molecular Clouds: Fractal Boundaries and Density Structure. *E. Falgarone, T. G. Phillips, & C. K. Walker*. 378, 186, 153-C8 (1991)
- Molecular Gas in Elliptical Galaxies. *Joanna F. Lees, G. R. Knapp, Michael P. Rupen, & T. G. Phillips*. 379, 177, 165-B11 (1991)
- PHINNEY, E. S. Modification of Stellar Populations in Post-Core-Collapse Globular Clusters. *S. Djorgovski, G. Piotto, E. S. Phinney, & D. F. Chernoff*. 372, L41, 79-E11 (1991)
- The Rate of Neutron Star Binary Mergers in the Universe: Minimal Predictions for Gravity Wave Detectors. *E. S. Phinney*. 380, L17, 181-C6 (1991)
- PIATTI, A. Detection of the Helium Flash Gap in the Integrated ( $U - B$ ) versus ( $B - V$ ) Diagram for 624 Large Magellanic Cloud Clusters. *E. Bica, J. J. Clariá, H. Dotto, J. F. C. Santos, Jr., & A. Piatti*. 381, L51, 199-C7 (1991)
- PICARD, ALAIN. The Angular Correlation Function of Galaxies from POSS-II. *Alain Picard*. 368, L7, 28-B7 (1991)
- PICCHIO, G. s-Process Nucleosynthesis in Massive Stars and the Weak Component. I. Evolution and Neutron Captures in a 25  $M_{\odot}$  Star. *C. M. Raiteri, M. Busso, R. Gallino, G. Picchio, & L. Pulone*. 367, 228, 14-G13 (1991)
- s-Process Nucleosynthesis in Massive Stars and the Weak Component. II. Carbon Burning and Galactic Enrichment. *C. M. Raiteri, M. Busso, R. Gallino, & G. Picchio*. 371, 665, 69-G6 (1991)
- PICCIIRILLO, L. Diffuse Galactic Emission at Millimetric Wavelengths. *P. Andreani, G. Dall'Olgo, L. Martinis, L. Piccirillo, L. Pizza, L. Rossi, & C. Venturino*. 375, 148, 112-G5 (1991)
- PICKETT, H. M. See WANNIER, P. G., et al. Water in Dense Molecular Clouds.
- PICKUP, D. A. See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- PIER, EDWARD A. Relativistic Motion in Gamma-Ray Bursts. *Julian H. Krolik & Edward A. Pier*. 373, 277, 89-D8 (1991)
- PIERCE, A. KEITH. Solar Gravitational Redshift from the Infrared Oxygen Triplet. *James C. LoPresto, Charles Schrader, & A. Keith Pierce*. 376, 757, 135-F11 (1991)
- PIKE, G. See EDELSON, R. A., et al. Rapid Ultraviolet Variability in the BL Lacertae Object PKS 2155-304.
- PINEAU DES FORÉTS, G. The Gas-Phase Chemistry of Organic Molecules in Interstellar Clouds with Dynamical Mixing. *J.-P. Chièze, G. Pineau des Forêts, & Eric Herbst*. 373, 110, 87-D4 (1991)
- PINSONNEAULT, MARC H. Evolutionary Models of Halo Stars with Rotation. I. Evidence for Differential Rotation with Depth in Stars. *Marc H. Pinsonneault, Constantine P. Deliyannis, & Pierre Demarque*. 367, 239, 15-A12 (1991)
- PINTO, PHILIP A. Spectra of Two Very Old Supernovae: SN 1986J and SN 1980K. *Bruno Leibundgut, Robert P. Kirshner, Philip A. Pinto, Michael P. Rupen, R. Chris Smith, James E. Gunn, & Donald P. Schneider*. 372, 531, 82-D1 (1991)
- PIOTTO, G. Modification of Stellar Populations in Post-Core-Collapse Globular Clusters. *S. Djorgovski, G. Piotto, E. S. Phinney, & D. F. Chernoff*. 372, L41, 79-E11 (1991)
- PIPER, J. L. Infrared and Visible Photometry of the Gravitational Lens System 2237+030. *Daniel Nadeau, H. K. C. Yee, W. J. Forrest, J. D. Garnett, Z. Ninkov, & J. L. Piper*. 376, 430, 131-G1 (1991)
- PIRAN, TSVI. Neutron Star and Black Hole Binaries in the Galaxy. *Ramesh Narayan, Tsvi Piran, & Amotz Shemi*. 379, L17, 169-B11 (1991)
- The Origin of the Planet around PSR 1829-10. *Takashi Nakamura & Tsvi Piran*. 382, L81, 211-C13 (1991)
- PIRO, L. X-Ray Observations of the Seyfert 1 Galaxy Markarian 464. *L. Piro, G. Matt, E. Costa, D. Dal Fiume, F. Frontera, & E. Morelli*. 380, 357, 182-F9 (1991)
- PIRONELLO, V. Description of Large Molecules from Grains in Dense Interstellar Clouds. *R. E. Johnson, V. Pironello, B. Sundqvist, & B. Donn*. 379, L75, 175-D12 (1991)
- PIZZO, L. Diffuse Galactic Emission at Millimetric Wavelengths. *P. Andreani, G. Dall'Olgo, L. Martinis, L. Piccirillo, L. Pizza, L. Rossi, & C. Venturino*. 375, 148, 112-G5 (1991)
- PLACHCO M., FLORENCIO P. On the Thermal Stability of Slabs, Cylinders, and Spheres. *Miguel H. Ibáñez S., & Florencio P. Plachco M.* 370, 743, 57-F1 (1991)
- PLAMBECK, RICHARD L. Fossil DCN in Orion-KL. *Jeffrey G. Mangum, Richard L. Plambeck, & Alwyn Wootten*. 369, 169, 38-A11 (1991)
- PLANESAS, P. High-Resolution Aperture Synthesis of Molecular Gas in NGC 1068. *P. Planesas, N. Scoville, & S. T. Myers*. 369, 364, 42-C9 (1991)
- High-Resolution CO Observations of Luminous Infrared Galaxies with Large  $L_{\text{ir}}/L_B$  Ratios: IRAS 10173+0828, Zw 049.057, IRAS 17208-0014. *P. Planesas, I. F. Mirabel, & D. B. Sanders*. 370, 172, 49-C5 (1991)
- PLANTE, R. L. Possible Deflection of a Jet by Molecular Clouds in NGC 4258. *R. L. Plante, K. Y. Lo, Jean-René Roy, Pierre Martin, & Louis Noreau*. 381, 110, 190-D4 (1991)
- PLUME, RENÉ. OH Emission and the Nature of Minkowski's Footprint (M1-92). *E. R. Seaquist, René Plume, & L. E. Davis*. 367, 200, 14-E5 (1991)
- POETZEL, RALF. An Optical/Infrared Outburst in the Exciting Source of HH 7-11. *Jochen Eisloffel, Eike Günther, Frederic V. Hessman, Reinhard Mundt, Ralf Poetzel, John S. Carr, Steven Beckwith, & Tom P. Ray*. 383, L19, 219-C7 (1991)
- POGUE, R. W. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- The Far-Infrared Morphology of the Double-ringed Galaxy NGC 4736 (M94): A Ring Surrounding an Extended Nucleus. *Beverly J. Smith, D. F. Lester, P. M. Harvey, & R. W. Pogge*. 373, 66, 86-G5 (1991)
- The Far-Infrared Morphology of the Double-ringed Spiral Galaxy NGC 4736 (M94): A Ring Surrounding an Extended Nucleus: Erratum. *Beverly J. Smith, D. F. Lester, P. M. Harvey, & R. W. Pogge*. 380, 677, 186-E6 (1991) (Orig. paper in 373, 66, 86-G5 (1991))
- POGGE, RICHARD W. The Interstellar Medium of the Hot-Spot Galaxy NGC 2903. *James M. Jackson, Andreas Eckart, Murray Cameron, Wolfgang Wild, Paul T. P. Ho, Richard W. Pogge, & Andrew I. Harris*. 375, 105, 112-C9 (1991)
- POGLITSCH, A. The 158 Micron [C II] Line: A Measure of Global Star Formation Activity in Galaxies. *G. J. Stacey, N. Geis, R. Genzel, J. B. Lugin, A. Poglitsch, A. Sternberg, & C. H. Townes*. 373, 423, 93-C1 (1991)
- A Survey of the 158 Micron [C II] Fine-Structure Line in the Central 50 Parsecs of The Galaxy. *A. Poglitsch, G. J. Stacey, N. Geis, M. Haggerty, J. Jackson, M. Rumitz, R. Genzel, & C. H. Townes*. 374, L33, 110-B5 (1991)
- The Optical Depth of the 158 Micron [<sup>12</sup>C II] Line: Detection of the  $F = 1 \rightarrow 0$  [<sup>13</sup>C II] Hyperfine-Structure Component. *G. J. Stacey, C. H. Townes, A. Poglitsch, S. C. Madden, J. M. Jackson, E. Hermann, R. Genzel, & N. Geis*. 382, L37, 205-E1 (1991)
- POLAND, A. I. Opacity Effects on the Radiative Losses of Coronal Loops. *N. P. M. Kuin & A. I. Poland*. 370, 763, 57-G11 (1991)
- POLCARO, V. F. Low-Flux Hard X-Ray Observation of Cygnus X-1. *P. Ubertini, A. Bazzano, C. La Padula, R. K. Manchanda, V. F. Polcaro, R. Staubert, E. Kendziorra, & F. Perotti*. 383, 263, 215-D9 (1991)

- POLIDAN, R. S. Absolute Far-Ultraviolet Spectrophotometry of Hot Subluminous Stars from *Voyager*. *J. B. Holberg, B. Ali, T. E. Carone, & R. S. Polidan*. 375, 716, 121-E1 (1991)
- POLIDAN, RONALD S. On the X-Ray-emitting Boundary Layer of the Dwarf Nova VW Hydri. *Christopher W. Mauche, Richard A. Wade, Ronald S. Polidan, Hans van der Woerd, & Frits B. S. Paerels*. 372, 659, 83-G7 (1991)
- POLITANO, MICHAEL. The White Dwarf Mass Distribution in Classical Nova Systems. *Hans Ritter, Michael Politano, Mario Livio, & Ronald F. Webbink*. 376, 177, 127-B10 (1991)
- POLLACK, JAMES B. The Dynamical Evolution of the Protosolar Nebula. *Steven P. Ruden & James B. Pollack*. 375, 740, 121-G11 (1991)
- POMERANTZ, M. A. Measurements of High-Frequency Solar Oscillation Modes. *T. L. Duvall, Jr., J. W. Harvey, S. M. Jefferies, & M. A. Pomerantz*. 373, 308, 89-G1 (1991)
- Characteristics of Intermediate-Degree Solar *p*-Mode Line Widths. *S. M. Jefferies, T. L. Duvall, Jr., J. W. Harvey, Y. Osaki, & M. A. Pomerantz*. 377, 330, 142-A11 (1991)
- PONMAN, T. J. The Distribution of Dark Matter in the Perseus Cluster. *C. J. Eyles, M. P. Watt, D. Bertram, M. J. Church, T. J. Ponman, G. K. Skinner, & A. P. Willmore*. 376, 23, 125-C12 (1991)
- POOLEY, G. See GIOMMI, P., et al. The EXOSAT High Galactic Latitude Survey.
- POPHAM, ROBERT. Does Accretion Cease When a Star Approaches Breakup? *Robert Popham & Ramesh Narayan*. 370, 604, 56-A6 (1991)
- PORTER, ALAIN. See DUNCAN, DOUGLAS K., et al. Ca II H and K Measurements Made at Mount Wilson Observatory, 1966-1983.
- PORTER, J. G. The Magnetic Network Location of Explosive Events Observed in the Solar Transition Region. *J. G. Porter & K. P. Dere*. 370, 775, 58-A11 (1991)
- PORTUGAL, R. Magnetohydrodynamic Cosmologies. *R. Portugal & I. Damiao Soares*. 380, 330, 182-D5 (1991)
- POTTER, M. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- POUND, MARC W. Two New Molecular Outflows in L1551? *Marc W. Pound & John Bally*. 383, 705, 223-A7 (1991)
- PRANTZOS, N. On the Sodium Excess in the Atmospheres of Yellow Supergiants. *N. Prantzos, A. Coc, & J. P. Thibaud*. 379, 729, 173-G1 (1991)
- PRASAD, SHEO S. Dynamical Evolution and Molecular Abundances of Interstellar Clouds. *Sheo S. Prasad, Karen R. Heere, & Shankar P. Tarafdar*. 373, 123, 87-E5 (1991)
- PRATAP, PREETHI. VLBI Observations of Interstellar Ammonia Masers. *Preeti Pratap, Karl M. Menten, Mark J. Reid, James M. Moran, & C. Malcolm Walmsley*. 373, L13, 91-B12 (1991)
- PRESS, WILLIAM H. Solar-Cycle Modulation of Event Rates in the Chlorine Solar Neutrino Experiment. *John N. Bahcall & William H. Press*. 370, 730, 57-E1 (1991)
- PRESTON, GEORGE W. See DUNCAN, DOUGLAS K., et al. Ca II H and K Measurements Made at Mount Wilson Observatory, 1966-1983.
- Detection of a Galactic Color Gradient for Blue Horizontal-Branch Stars of the Halo Field and Implications for the Halo Age and Density Distributions. *George W. Preston, Stephen A. Shectman, & Timothy C. Beers*. 375, 121, 112-E1 (1991)
- Photoelectric *UBV* Photometry of Stars Selected in the HK Objective-Prism Survey. *George W. Preston, Stephen A. Shectman, & Timothy C. Beers*. 76, 1001, 38-G5 (1991)
- PRESTWICH, ANDREA H. Cooling Flows and the Formation of Massive Halos in cD Galaxies. *Andrea H. Prestwich & Marshall Joy*. 369, L1, 40-A7 (1991)
- PRIEST, E. R. A Twisted Flux-Tube Model for Solar Prominences. III. Magnetic Support. *C. Ridgway, E. R. Priest, & T. Amari*. 367, 321, 16-A10 (1991)
- Prominence Sheets Supported by Constant-Current Force-free Fields. I. Imposition of Normal Magnetic Field Components at the Current Sheet and the Photosphere. *C. Ridgway, T. Amari, & E. R. Priest*. 378, 773, 162-A1 (1991)
- PRIMINI, F. A. The CTA Einstein Observatory Extended Deep X-Ray Survey. *F. A. Primini, S. S. Murray, J. Huchra, R. Schild, R. Burg, & R. Giacconi*. 374, 440, 104-E12 (1991)
- PRINCE, T. A. Timing Observations of the 8 Hour Binary Pulsar 2127+11C in the Globular Cluster M15. *T. A. Prince, S. B. Anderson, S. R. Kulkarni, & A. Wolszczan*. 374, L41, 110-C1 (1991)
- PRINCE, THOMAS A. Coded-Aperture Imaging of the Galactic Center Region at Gamma-Ray Energies. *Walter R. Cook, John M. Grunsfeld, William A. Heindl, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone*. 372, L75, 85-D1 (1991)
- PRINGLE, J. E. The Effect of an External Disk on the Orbital Elements of a Central Binary. *P. Artymowicz, C. J. Clarke, S. H. Lubow, & J. E. Pringle*. 370, L35, 53-E7 (1991)
- The Formation of Primordial Binaries in Globular Clusters by Star-Disk Interactions. *Stephen D. Murray, C. J. Clarke, & J. E. Pringle*. 383, 192, 214-D7 (1991)
- PRINJA, RAMAN K. Terminal Velocities for a Large Sample of O Stars, B Supergiants, and Wolf-Rayet Stars: Erratum. *Raman K. Prinja, M. J. Barlow, & Ian D. Howarth*. 383, 466, 218-B1 (1991) (Orig. paper in 379, 734, 173-G8 (1991))
- PRITCHET, C. J. The Lithium Abundance of M67 Blue Stragglers: A Constraint on the Blue Straggler Phenomenon. *C. J. Pritchett & J. W. Glaspay*. 373, 105, 87-C12 (1991)
- PRITCHET, CHRISTOPHER J. The Luminosity Distribution of Globular Clusters in Three Giant Virgo Ellipticals. *William E. Harris, J. W. B. Allwright, Christopher J. Pritchett, & Sidney van den Berg*. 76, 115, 25-D11 (1991)
- PROBST, RON. Spectroscopy of Taurus Cloud Brown Dwarf Candidates. *John Stauffer, Terry Herter, Donald Hamilton, George H. Rieke, Marcia J. Rieke, Ron Probst, & William Forrest*. 367, L23, 17-D7 (1991)
- PROBST, RONALD G. Search for Vega-like Nearby Stars with 12 Micron Excess. *Hartmut H. Aumann & Ronald G. Probst*. 368, 264, 26-D1 (1991)
- PROFFITT, CHARLES R. Diffusion and Mixing of Lithium and Helium in Population II Dwarfs. *Charles R. Proffitt & Georges Michaud*. 371, 584, 68-G1 (1991)
- Gravitational Settling in Solar Models. *Charles R. Proffitt & Georges Michaud*. 380, 238, 179-A5 (1991)
- Implications of Helium Diffusion for Globular Cluster Isochrones and Luminosity Functions. *Charles R. Proffitt & Don A. VandenBerg*. 77, 473, 51-C10 (1991)
- PROTHEROE, R. J. Cosmic-Ray Transport and Gamma-Ray Emission in Supernova Shells. *A. K. Harding, A. Mastichiadis, R. J. Protheroe, & A. P. Szabo*. 378, 163, 153-A9 (1991)
- PROUST, D. Deep Spectroscopy under High Spatial Resolution of the High-Redshift Radio Source 3CR 368: The Monster Elucidated. *F. Hammer, O. Le Fevre, & D. Proust*. 374, 91, 99-B7 (1991)
- PROVENCAL, J. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- PROVENCAL, J. L. See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- PRUSTI, T. The Temperature of Large Dust Grains in Molecular Clouds. *F. O. Clark, R. J. Laureijs, & T. Prusti*. 371, 602, 69-A7 (1991)
- IRAS Detection of Very Cold Dust in the Lynds 134 Cloud Complex. *R. J. Laureijs, F. O. Clark, & T. Prusti*. 372, 185, 76-C4 (1991)
- PUCHE, DANIEL. H I Studies of the Sculptor Group Galaxies. VII. Implications on the Distribution and Nature of Dark Matter in Groups. *Daniel Puche & Claude Carignan*. 378, 487, 158-E1 (1991)
- PUETTER, R. C. Near-Infrared Spectroscopy of the Planetary Nebula NGC 6572. *Richard J. Rudy, George S. Rossano, Peter Erwin, & R. C. Puetter*. 368, 468, 30-G13 (1991)
- The 0.46-1.3 Micron Spectrum of the Planetary Nebula BD +30°3639. *Richard J. Rudy, Ross D. Cohen, George S. Rossano, Peter Erwin, R. C. Puetter, & David K. Lynch*. 380, 151, 178-A1 (1991)
- Near-Infrared [Fe II] Emission of M82 Supernova Remnants: Implications for Tracing the Supernova Content of Galaxies. *Matthew A. Greenhouse, Charles E. Woodward, Harley A. Thronson, Jr., Richard J. Rudy, George S. Rossano, Peter Erwin, & R. C. Puetter*. 383, 164, 214-B1 (1991)
- The 1.0-1.3 Micron Spectrum of LkHα 101. *Richard J. Rudy, Peter Erwin, George S. Rossano, & R. C. Puetter*. 383, 344, 216-D7 (1991)

- PULONE, L. *s*-Process Nucleosynthesis in Massive Stars and the Weak Component. I. Evolution and Neutron Captures in a  $25 M_{\odot}$  Star. *C. M. Raiteri, M. Busso, R. Gallino, G. Picchio, & L. Pulone.* 367, 228, 14-G13 (1991)
- The Evolution of He-burning Stars: Horizontal and Asymptotic Branches in Galactic Globulars. *V. Castellani, A. Chieffi, & L. Pulone.* 76, 911, 37-C5 (1991)
- PULS, J. See HEAP, S. R., et al. First Results from the Goddard High-Resolution Spectrograph: Spectroscopic Determination of Stellar Parameters of Melnick 42, an O3f Star in the Large Magellanic Cloud.
- PUNCH, M. See AKERLOF, C. W., et al. Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy.
- PUNSLY, BRIAN. Magnetically Dominated Accretion onto Black Holes. *Brian Punsky.* 372, 424, 81-B1 (1991)
- PURCELL, W. R. HEAO 3 Upper Limits to Pulsed Gamma-Ray Emission from PSR 1509-58 and PSR 0833-45. *M. P. Ulmer, W. R. Purcell, W. A. Wheaton, & W. A. Mahoney.* 369, 485, 43-F12 (1991)
- PURIĆ, J. Regularities of Stark Parameters along the Periodic Table. *J. Purić, M. Čuk, M. S. Dimitrijević, & A. Lesage.* 382, 353, 204-E7 (1991)
- PURTON, C. R. IRAS 23545+6508, a Dissociating Star: Prototype for a New Observational Class? *P. E. Dewdney, R. S. Roger, C. R. Purton, & W. H. McCutcheon.* 370, 243, 50-C1 (1991)
- PUTNEY, A. LMC X-4: Ginga Observations and Search for Orbital Period Changes. *A. Levine, S. Rappaport, A. Putney, R. Corbet, & F. Nagase.* 381, 101, 190-C7 (1991)
- PUXLEY, P. See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- PUXLEY, P. J. Molecular and Atomic Hydrogen Line Emission from Star-forming Galaxies: Erratum. *P. J. Puxley, T. G. Hawarden, & C. M. Mountain.* 372, 733, 84-F13 (1991) (Orig. paper in 364, 77, 195-A1 (1990))
- QUADRINI, E. See UBERTINI, P., et al. "Superlow-State" Hard X-Ray Observation of Cygnus X-1.
- See BAZZANO, A., et al. Hard X-Rays from Coma Cluster Region: Erratum.
- See PEROTTI, F., et al. Hard X-Ray Variability of NGC 4151.
- QUARTA, M. L. The Galactic Globular Cluster System: Theoretical Constraints for  $\alpha$ -enhanced Compositions. *D. Bencivelli, F. Caputo, M. Maniega, & M. L. Quarta.* 380, 484, 184-C1 (1991)
- QUIN, D. A. IUE Observations of Early-Type Stars at High Galactic Latitudes. *D. A. Quin, P. J. F. Brown, E. S. Conlon, P. L. Dufton, & F. P. Keenan.* 375, 342, 115-B7 (1991)
- QUINN, PETER J. See GRIEST, KIM, et al. Gravitational Microlensing as a Method of Detecting Disk Dark Matter and Faint Disk Stars.
- QUIRRENBACH, A. Correlated Radio and Optical Variability in the BL Lacertae Object 0716+714. *A. Quirrenbach, A. Witzel, S. Wagner, F. Sanchez-Pons, T. P. Krichbaum, R. Wegner, K. Anton, U. Erkens, M. Hachelt, J. A. Zensus, & K. J. Johnston.* 372, L71, 85-C9 (1991)
- RABAEG, G. F. Application of the Continuous Orthonormalization and Adjoint Methods to the Computation of Solar Eigenfrequencies and Eigenfrequency Sensitivities. *R. D. Rosenwald & G. F. Rabaey.* 77, 97, 44-G1 (1991)
- RABIN, DOUGLAS. Energy Balance in Coronal Funnel. *Douglas Rabin.* 383, 407, 217-D1 (1991)
- RADFORD, SIMON J. E. CO Excitation and  $H_2$  Masses of Infrared-luminous Galaxies. *Simon J. E. Radford, P. M. Solomon, & D. Downes.* 368, L15, 28-C7 (1991)
- RAFERT, J. B. Simultaneous Light and Radial Velocity Curve Solutions for U Cephei. *J. B. Rafert & N. L. Markworth.* 377, 278, 141-D5 (1991)
- RAFFELT, GEORG. Window for the Dark Matter Solution to the Solar Neutrino Problem. *David Dearborn, Kim Griest, & Georg Raffelt.* 368, 626, 33-A1 (1991)
- RAGA, A. C. Mixing Layers in Stellar Outflows. *J. Cantó & A. C. Raga.* 372, 646, 83-F7 (1991)
- The Collimation of a Time-dependent Stellar Wind. *S.-H. Kim & A. C. Raga.* 379, 689, 173-C4 (1991)
- RAITERI, C. M. *s*-Process Nucleosynthesis in Massive Stars and the Weak Component. I. Evolution and Neutron Captures in a  $25 M_{\odot}$  Star. *C. M. Raiteri, M. Busso, R. Gallino, G. Picchio, & L. Pulone.* 367, 228, 14-G13 (1991)
- s*-Process Nucleosynthesis in Massive Stars and the Weak Component. II. Carbon Burning and Galactic Enrichment. *C. M. Raiteri, M. Busso, R. Gallino, & G. Picchio.* 371, 665, 69-G6 (1991)
- RAJAGOPAL, M. The Statistics of Slow Interstellar Accretion onto Neutron Stars. *O. Blaes & M. Rajagopal.* 381, 210, 191-E10 (1991)
- RAKOS, KARL D. Narrow-Band Photometry and the Evolution of Galaxies. III. The Intermediate-Redshift Sample. *Karl D. Rakos, James M. Schombert, & Tobias J. Kreidl.* 377, 382, 144-E7 (1991)
- RALSTON, JOHN P. Hollow Galactic Halos of Fermionic Dark Matter. *John P. Ralston & Lesley L. Smith.* 367, 54, 12-F4 (1991)
- RAMANI, A. Precollapse Scale Invariance in Gravitational Instability. *F. Moutarde, J.-M. Alimi, F. R. Bouchet, R. Pellat, & A. Ramani.* 382, 377, 206-C5 (1991)
- RAMATY, R. Solar Abundances from Gamma-Ray Spectroscopy: Comparisons with Energetic Particles, Photospheric, and Coronal Abundances. *R. J. Murphy, R. Ramaty, B. Kozlovsky, & D. V. Reames.* 371, 793, 71-D6 (1991)
- RAMATY, REUVEN. Positron Annihilation in the Interstellar Medium. *Nidal Guessoum, Reuven Ramaty, & Richard E. Lingenfelter.* 378, 170, 153-B4 (1991)
- RAMSAY, S. K. See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- RAMSEY, LAWRENCE W. Detection of Possible  $p$ -Mode Oscillations on Procyon. *Timothy M. Brown, Ronald L. Gilliland, Robert W. Noyes, & Lawrence W. Ramsey.* 368, 599, 32-E8 (1991)
- RAMEYER, TOD F. V795 Herculis (=PG 1711+336), A Peculiar Intermediate Polar without Strong X-Ray Emission. *Erho Zhang, Edward L. Robinson, Tod F. Ramseyer, Mathew D. Shetrone, & Rae F. Stiening.* 381, 534, 197-C10 (1991)
- RANKIN, JOANNA M. Microstructure-determined Pulsar Dispersion Measures and the Problem of Profile Alignment. *Timothy H. Hankins, Vera A. Izvekova, Valerii M. Malofeev, Joanna M. Rankin, Yuri P. Shitov, & Daniel R. Stinebring.* 373, L17, 91-C1 (1991)
- RANNOT, R. C. Possible Detection of TeV Gamma Rays from AM Herculis. *C. L. Bhat, R. K. Kaul, H. S. Rawat, V. K. Seneca, R. C. Rannat, M. L. Sapru, A. K. Tickoo, & H. Razdan.* 369, 475, 43-E12 (1991)
- RAO, A. R. X-Ray Luminosity and Spectral Variability in the Seyfert Type I Galaxy: PG 2130+099. *K. P. Singh, A. R. Rao, & M. N. Vahia.* 372, 49, 74-E13 (1991)
- X-Ray Observations of the Bright Seyfert Galaxy IC 4329A. *K. P. Singh, A. R. Rao, & M. N. Vahia.* 377, 417, 145-A1 (1991)
- RAO, P. VIVEKANANDA. Spin-up of the White Dwarf in the Intermediate Polar 3A 0729+103. *Jyoti Singh, P. C. Agarwal, K. M. V. Apparao, P. Vivekananda Rao, & M. B. K. Sarma.* 380, 208, 178-E11 (1991)
- RAPPAPORT, S. LMC X-4: Ginga Observations and Search for Orbital Period Changes. *A. Levine, S. Rappaport, A. Putney, R. Corbet, & F. Nagase.* 381, 101, 190-C7 (1991)
- RAPPAPORT, SAUL. Evolution of Compact Binary Systems with X-Ray Heating. *Amos Harpaz & Saul Rappaport.* 383, 739, 223-D3 (1991)
- RASHED, HUSSAIN. The Optical Emission from Oscillating White Dwarf Radiative Shock Waves. *James N. Imamura, Hussain Rashed, & Michael T. Wolff.* 378, 665, 160-F5 (1991)
- RASILLA, J. L. An Optical Fiber System to Perform Bidimensional Spectroscopy. *S. Arribas, E. Mediavilla, & J. L. Rasilla.* 369, 260, 39-B9 (1991)
- RASIO, FREDERIC A. Collisions of Giant Stars with Compact Objects: Hydrodynamical Calculations. *Frederic A. Rasio & Stuart L. Shapiro.* 377, 559, 146-F1 (1991)
- RATNATUNGA, KAVAN U. Metallicity and Velocity Distribution of Giants toward the Galactic Poles. *Kavan U. Ratnatunga & Kenneth M. Yoss.* 377, 442, 145-C3 (1991)
- RAUBENHEIMER, B. C. No Evidence for TeV Gamma Radiation from 2CG 006-00. *H. I. Nel, B. C. Raubenheimer, O. C. de Jager, R. Buccieri, M. Bussetta, A. R. North, & C. Brink.* 368, 585, 32-D4 (1991)
- RAUCH, KEVIN P. Gravitational Microlensing of High-Redshift Supernovae by Compact Objects. *Kevin P. Rauch.* 374, 83, 99-A11 (1991)

- Microlensing and the Structure of Active Galactic Nucleus Accretion Disks.** Kevin P. Rauch & Roger D. Blandford. 381, L39, 199-B1 (1991)
- Gravitational Microlensing of High-Redshift Supernovae by Compact Objects: Erratum.** Kevin P. Rauch. 383, 466, 218-B1 (1991) (Orig. paper in 374, 83, 99-A11 (1991))
- RAWAT, H. S.** Possible Detection of TeV Gamma Rays from AM Herculis. C. L. Bhat, R. K. Kaul, H. S. Rawat, V. K. Senecha, R. C. Rannat, M. L. Sapru, A. K. Tickoo, & H. Razdan. 369, 475, 43-E12 (1991)
- RAY, A.** The Formation and Detection of Strongly Magnetic White Dwarf Binaries in Globular Clusters. G. Channugam, A. Ray, & K. P. Singh. 375, 600, 120-B9 (1991)
- RAY, TOM P.** An Optical/Infrared Outburst in the Exciting Source of HH 7-11. Jochen Eislöffel, Eike Günther, Frederic V. Hessman, Reinhard Mundt, Ralf Poetzel, John S. Carr, Steven Beckwith, & Tom P. Ray. 383, L19, 219-C7 (1991)
- RAYMOND, J. C.** The Ultraviolet Spectrum of Scorpius X-1 as Observed by IUE: 1978-1988. T. R. Kallman, J. C. Raymond, & S. D. Vrilek. 370, 717, 57-C11 (1991)
- Observations of Scorpius X-1 with IUE: Ultraviolet Results from a Multiwavelength Campaign. S. D. Vrilek, W. Penninx, J. C. Raymond, F. Verbunt, P. Heriz, K. Wood, W. H. G. Lewin, & K. Mitsuda. 376, 278, 128-D1 (1991)
- RAYMOND, JOHN C.** Evidence for a Thermally Unstable Shock Wave in the Vela Supernova Remnant. John C. Raymond, George Wallerstein, & Bruce Balick. 383, 226, 214-G5 (1991)
- RAYNER, J.** See KOYAMA, K., et al. An X-Ray Pulsator in the Direction of Molecular Cloud MBM 12 (Lynds 1457).
- RAZDAN, H.** Possible Detection of TeV Gamma Rays from AM Herculis. C. L. Bhat, R. K. Kaul, H. S. Rawat, V. K. Senecha, R. C. Rannat, M. L. Sapru, A. K. Tickoo, & H. Razdan. 369, 475, 43-E12 (1991)
- REACH, WILLIAM T.** Zodiacal Emission. II. Dust near the Ecliptic. William T. Reach. 369, 529, 44-C13 (1991)
- READ, S. M.** See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a 7° Beam by the Cosmic Background Explorer (COBE).
- REAMES, D. V.** Solar Abundances from Gamma-Ray Spectroscopy: Comparisons with Energetic Particle, Photospheric, and Coronal Abundances. R. J. Murphy, R. Ramay, B. Kozlovsky, & D. V. Reames. 371, 793, 71-D6 (1991)
- Solar Particle Abundances at Energies Greater than 1 MeV per Nucleon and the Role of Interplanetary Shocks. H. V. Cane, D. V. Reames, & T. T. von Rosenvinge. 373, 675, 96-D1 (1991)
- Multispacecraft Observations of Solar  $^3\text{He}$ -rich Events. D. V. Reames, M.-B. Kallenrode, & R. G. Stone. 380, 287, 179-G1 (1991)
- On the Differences in Element Abundances of Energetic Ions from Corotating Events and from Large Solar Events. D. V. Reames, I. G. Richardson, & L. M. Barbier. 382, L43, 205-E7 (1991)
- REFFO, G.** The  $s$ -Process Branchings at  $^{185}\text{W}$  and  $^{186}\text{Re}$ . F. Käppeler, S. Jaag, Z. Y. Bao, & G. Reffo. 366, 605, 10-E5 (1991)
- REGÓS, ENIKÓ.** The Evolution of Void-filled Cosmological Structures. Enikő Regős & Margaret J. Geller. 377, 14, 138-C1 (1991)
- REID, I. NEILL.** Gravitational Redshift Determinations for White Dwarfs in Common Proper-Motion Binaries. Gary Wegner & I. Neill Reid. 375, 674, 121-B1 (1991)
- Gravitational Redshift for the Pleiad White Dwarf LB 1497. Gary Wegner, I. Neill Reid, & Robert K. McMahan, Jr. 376, 186, 127-C6 (1991)
- REID, MARK J.** VLBI Observations of Interstellar Ammonia Masers. Preethi Pratap, Karl M. Menten, Mark J. Reid, James M. Moran, & Malcolm Walmsley. 373, L13, 91-B12 (1991)
- REID, NEILL.** Cocoon Stars in the Large Magellanic Cloud. Neill Reid. 382, 143, 202-A4 (1991)
- REIDL, CHARLES J., JR.** Gravity in One Dimension: A Correction for Ensemble Averaging. Charles J. Reidl, Jr., & Bruce N. Miller. 371, 260, 63-D1 (1991)
- RÉME, H.** Sulfur-bearing Ions in the Ionosphere of Comet Halley. M. L. Marconi, D. A. Mendis, D. L. Mitchell, R. P. Lin, A. Korth, & H. Réme. 378, 756, 161-F7 (1991)
- Observations of Solar Wind Ion Charge Exchange in the Comet Halley Coma.** S. A. Fuselier, E. G. Shelley, B. E. Goldstein, R. Goldstein, M. Neugebauer, W.-H. Ip, H. Balsiger, & H. Réme. 379, 734, 173-G8 (1991)
- REMILLARD, R. A.** Ginga Observation of an AM Herculis Type Source H0538+608. M. Ishida, A. Silber, H. V. Bradt, R. A. Remillard, K. Makishima, & T. Ohashi. 367, 270, 15-D6 (1991)
- The Eclipsing AM Herculis Variable H1907+690. R. A. Remillard, B. A. Stroozas, S. Tapia, & A. Silber. 379, 715, 173-E13 (1991) See COWLEY, A. P., et al. Discovery of a Long-Term Periodic Variation in LMC X-3.
- REMILLARD, RONALD A.** The X-Ray Cooling Flow in the Cluster of Galaxies around PKS 2354-35. Daniel A. Schwartz, Hale V. Bradt, Ronald A. Remillard, & I. R. Tuohy. 376, 424, 131-F6 (1991)
- RENZINI, ALVIO.** Winds, Outflows, and Inflows in X-Ray Elliptical Galaxies. I. Luca Ciotto, Annibale D'Ercoli, Silvia Pellegrini, & Alvio Renzini. 376, 380, 131-B12 (1991)
- REPHAEI, YOEL.** Peculiar Cluster Velocities from Measurements of the Kinematic Sunyaev-Zeldovich Effect. Yoel Rephaeli & Ofer Lahav. 372, 21, 74-C7 (1991)
- Turbulently Generated Magnetic Fields in Clusters of Galaxies. Itzhak Goldman & Yoel Rephaeli. 380, 344, 182-E8 (1991)
- X-Ray Emission from Starburst Galaxies. Yoel Rephaeli, Duane Gruber, Massimo Persic, & Dan MacDonald. 380, L59, 188-C1 (1991)
- REUTER, DENNIS C.** Molecular Hydrogen in the Vicinity of NGC 7538 IRS 1 and IRS 2: Temperature and Ortho-to-Para Ratio. Susan Hoban, Dennis C. Reuter, Michael J. Mumma, & Alex D. Storrs. 370, 228, 50-A10 (1991)
- REYNOLDS, P. T.** See MACOMB, D. J., et al. Search for TeV Emission from 4U 0115+63.
- See VACANTI, G., et al. Gamma-Ray Observations of the Crab Nebula at TeV Energies.
- See AKERLOF, C. W., et al. Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy.
- Search for TeV Gamma-Ray Emission from Hercules X-1. P. T. Reynolds, M. F. Hawley, D. J. Fegan, A. M. Hillas, P. W. Kwock, R. C. Lamb, M. J. Lang, D. A. Lewis, D. J. Macomb, K. S. O'Flaherty, G. Vacanti, & T. C. Weeks. 382, 640, 209-E7 (1991)
- REYNOLDS, R. J.** Line Integrals of  $n_e$  and  $n_{\text{H}}$  at High Galactic Latitude. R. J. Reynolds. 372, L17, 79-C1 (1991)
- REYNOLDS, STEPHEN P.** A Determination of Relativistic Shock Jump Conditions Using Monte Carlo Techniques. Donald C. Ellison & Stephen P. Reynolds. 378, 214, 153-F1 (1991)
- Electron Acceleration in a Nonlinear Shock Model with Applications to Supernova Remnants. Donald C. Ellison & Stephen P. Reynolds. 382, 242, 203-C1 (1991)
- RHODES, E. J., JR.** What We Know about the Sun's Internal Rotation from Solar Oscillations. Philip R. Goode, W. A. Dziembowski, S. G. Korzennik, & E. J. Rhodes, Jr. 367, 649, 21-C11 (1991)
- RIBAK, EREZ.** Constrained Realizations of Gaussian Fields: A Simple Algorithm. Yehuda Hoffman & Erez Ribak. 380, L5, 181-B6 (1991)
- RICE, WALTER L.** Far-Infrared Properties of NGC 6822. John S. Gallagher III, Deidre A. Hunter, Fred C. Gillett, & Walter L. Rice. 371, 142, 61-G1 (1991)
- RICH, R. MICHAEL.** Radial Velocity Distribution and Line Strengths of 33 Carbon Stars in the Galactic Bulge. Neil D. Tyson & R. Michael Rich. 367, 547, 20-B6 (1991)
- Echelle Spectroscopy of CD -41° 13967: The Young Central Star of a New Planetary Nebula. James K. McCarthy, R. Michael Rich, S. R. Becker, K. Butler, D. Husfeld, & H. G. Groth. 371, 380, 64-G1 (1991)
- RICHARDSON, I. G.** On the Differences in Element Abundances of Energetic Ions from Corotating Events and from Large Solar Events. D. V. Reames, I. G. Richardson, & L. M. Barbier. 382, L43, 205-E7 (1991)
- RICHER, HARVEY B.** Multicomponent Models for the Dynamic Evolution of Globular Clusters. Hyung Mok Lee, Gregory G. Fahrlman, & Harvey B. Richer. 366, 455, 8-E1 (1991)
- The Stellar Content and Structure of the Globular Cluster NGC 5053. Gregory G. Fahrlman, Harvey B. Richer, & James Nemec. 380, 124, 177-E11 (1991)

- Globular Cluster Mass Functions.** *Harvey B. Richer, Gregory G. Fahman, Roberto Buonanno, Flavio Fusi Pecci, Leonard Searle, & Ian B. Thompson.* 381, 147, 190-G7 (1991)
- RICHER, MICHAEL G.** Neutral Oxygen in Planetary Nebulae: Probing Radiative Transfer and Nebular Structure. *Michael G. Richer, Marshall L. McCall, & Peter G. Martin.* 377, 210, 140-E1 (1991)
- RICHMOND, M. W.** See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- RICHSTONE, DOUGLAS O.** A Merger Scenario for NGC 7252: A Tale of Two Tails. *Kirk D. Borne & Douglas O. Richstone.* 369, 111, 37-C11 (1991)
- A Numerical Study of Star Formation in Interacting Disk Galaxies. *J. Christopher Mihos, Douglas O. Richstone, & Gregory D. Bothun.* 377, 72, 139-A1 (1991)
- RIDGWAY, C.** A Twisted Flux-Tube Model for Solar Prominences. III. Magnetic Support. *C. Ridgway, E. R. Priest, & T. Amari.* 367, 321, 16-A10 (1991)
- Prominence Sheets Supported by Constant-Current Force-free Fields. I. Imposition of Normal Magnetic Field Components at the Current Sheet and the Photosphere. *C. Ridgway, T. Amari, & E. R. Priest.* 378, 773, 162-A1 (1991)
- RIEKE, GEORGE H.** Spectroscopy of Taurus Cloud Brown Dwarf Candidates. *John Stauffer, Terry Herter, Donald Hamilton, George H. Rieke, Marcia J. Rieke, Ron Probst, & William Forrest.* 367, L23, 17-D7 (1991)
- RIEKE, MARCIA.** Emission from the  $z = 2$  Damped Ly $\alpha$  Absorber toward Q1215+333. *Richard Elston, Jill Bechtold, James Lowenthal, & Marcia Rieke.* 373, L39, 97-B1 (1991)
- RIEKE, MARCIA J.** Spectroscopy of Taurus Cloud Brown Dwarf Candidates. *John Stauffer, Terry Herter, Donald Hamilton, George H. Rieke, Marcia J. Rieke, Ron Probst, & William Forrest.* 367, L23, 17-D7 (1991)
- RINGUELET, A. E.** Be Stars: Chromospheres and Cool Envelopes and Their Relation to Magnetic Fields. *A. E. Ringuelet & M. E. Iglesias.* 369, 463, 43-D10 (1991)
- RIOPEL, MARTIN.** The Extinction to the H $_2$  Line Emission in the DR 21 Outflow Source. *Daniel Nadeau, Martin Riopel, & T. R. Geballe.* 372, L103, 85-F5 (1991)
- RITTER, HANS.** The White Dwarf Mass Distribution in Classical Nova Systems. *Hans Ritter, Michael Polito, Mario Livio, & Ronald P. Webbink.* 376, 177, 127-B10 (1991)
- RITZWOLLER, MICHAEL H.** A Unified Approach to the Helioseismic Forward and Inverse Problems of Differential Rotation. *Michael H. Ritzwoller & Eugene M. Lavelle.* 369, 557, 44-F5 (1991)
- RIX, HANS-WALTER.** An Infrared/Optical Investigation of 100 Micron "Cirrus." *Elizabeth S. Paley, Frank J. Low, John T. McGraw, Roc M. Cutri, & Hans-Walter Rix.* 376, 335, 129-A13 (1991)
- RIYOPoulos, SPILIOS.** Subthreshold Stochastic Diffusion with Application to Selective Acceleration of  $^3\text{He}$  in Solar Flares. *Spilos Riyopoulos.* 381, 578, 197-G5 (1991)
- ROBB, T. D.** Stability, Structure, and Evolution of Cool Loops. *P. S. Cally & T. D. Robb.* 372, 329, 78-A11 (1991)
- ROBERGE, W. G.** Interstellar Photodissociation and Photoionization Rates. *W. G. Roberge, D. Jones, S. Lepp, & A. Dalgarno.* 77, 287, 48-B1 (1991)
- ROBERT, CARMELLE.** Observations of Stellar Winds from Hot Stars at 1.3 Millimeters. *Claud Leitherer & Carmelle Robert.* 377, 629, 147-E1 (1991)
- ROBERTS, B.** The Sensitivity of Chromospherically Induced  $p$ - and  $f$ -Mode Frequency Shifts to the Height of the Magnetic Canopy. *David J. Evans & B. Roberts.* 371, 387, 64-G9 (1991)
- ROBERTS, MORTON S.** Interstellar Matter in Early-Type Galaxies. I. The Catalog. *Morton S. Roberts, David E. Hogg, Joel N. Bregman, William R. Forman, & Christine Jones.* 75, 751, 11-F5 (1991)
- Extrapolanar Ionized Gas and Kinematics in the Edge-on Galaxy NGC 891. *Jean W. Keppel, Ralf-Jürgen Dettmar, John S. Gallagher III, & Morton S. Roberts.* 374, 507, 105-D6 (1991)
- ROBERTSON, D. J.** See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- ROBINSON, EDWARD L.** The Pulse-timing and Emission-Line Orbits of the White Dwarf in the Cataclysmic Variable AE Aquarii. *Edward L. Robinson, Allen W. Shafter, & S. Balachandran.* 374, 298, 101-G1 (1991)
- V795 Herculis (=PG 1711+336), A Peculiar Intermediate Polar without Strong X-Ray Emission. *Erho Zhang, Edward L. Robinson, Tod F. Ramseyer, Mathew D. Shetrone, & Rae F. Stiening.* 381, 534, 197-C10 (1991)
- ROBINSON, RICHARD D.** First Results from the Goddard High-Resolution Spectrograph: The Chromosphere of  $\alpha$  Tauri. *Kenneth G. Carpenter, Richard D. Robinson, Glenn M. Wahlgren, Thomas B. Ake, Dennis C. Ebbets, Jeffrey L. Linsky, Alexander Brown, & Frederick M. Walter.* 377, L45, 143-E11 (1991)
- ROBINSON, RUTH L.** Atomic Oxygen Fine-Structure Splittings with Tunable Far-Infrared Spectroscopy. *Lyndon R. Zink, Kenneth M. Evenson, Fusakazu Matsushima, Thomas Nelis, & Ruth L. Robinson.* 371, L85, 73-E3 (1991)
- ROBSON, E. I.** Two Micron Spectroscopy of Infrared Sources in NGC 2071. *D. M. Walther, T. R. Geballe, & E. I. Robson.* 377, 246, 141-A9 (1991)
- ROBSON, E. IAN.** NGC 1333 IRAS 4: A Very Young, Low-Luminosity Binary System. *Göran Sandell, Colin Aspin, William D. Duncan, Adrian P. G. Russell, & E. Ian Robson.* 376, L17, 130-C1 (1991)
- ROCHE, P. F.** See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- ROCHE, PATRICK F.** Polarimetric Imaging of the Galactic Center at 12.4 Microns: The Detailed Magnetic Field Structure in the Northern Arm and East-West Bar. *David K. Aitken, Daniel Gezari, Craig H. Smith, Mark McCaughrean, & Patrick F. Roche.* 380, 419, 183-D10 (1991)
- RODGERS, ALEXANDER W.** See GRIEST, KIM, et al. Gravitational Microlensing as a Method of Detecting Disk Dark Matter and Faint Disk Stars.
- RODGERS, BERNADETTE.** The Temperature of the Circumstellar Envelope of Alpha Orionis. *Bernadette Rodgers & Alfred E. Glassgold.* 382, 606, 209-B1 (1991)
- RODRIGUEZ, L. F.** Multi-frequency VLA Observations of Radio Continuum from IRAS 16293–2422. *R. Estalella, G. Anglada, L. F. Rodríguez, & G. Garay.* 371, 626, 69-C12 (1991)
- RODRIGUEZ, LUIS F.** A Double Radio Source at the Center of the Outflow in L723. *Guillermo Anglada, Robert Estalella, Luis F. Rodríguez, José M. Torrelles, Rosario López, & Jorge Cantó.* 376, 615, 134-A7 (1991)
- The Dense Molecular Envelope around the Compact H II Region G5.89–0.39 (W28 A2). *Yolanda Gómez, Luis F. Rodríguez, Guido Garay, & James M. Moran.* 377, 519, 146-B9 (1991)
- RODRIGUEZ ESPINOZA, J. M.** Modeling an Accretion Disk in NGC 985. *R. M. Stanga, J. M. Rodriguez Espinoza, & F. Mannucci.* 379, 592, 172-A9 (1991)
- ROELLIG, T. L.** Submillimeter Solar Limb Profiles Determined from Observations of the Total Solar Eclipse of 1988 March 18. *T. L. Roellig, E. E. Becklin, J. T. Jefferies, G. A. Kopp, C. A. Lindsey, F. Q. Orrall, & M. W. Werner.* 381, 288, 192-E5 (1991)
- ROELLIG, THOMAS L.** Telescope Beam-Profile Diagnostics and the Solar Limb. *Charles A. Lindsey & Thomas L. Roellig.* 375, 414, 116-A9 (1991)
- RÖSSLEIN, MATTHIAS.** Laboratory Infrared Spectra of CH<sub>2</sub>D<sup>+</sup> and HCD<sup>+</sup> and Predicted Microwave Transitions. *Matthias Rösslein, Mary-Frances Jagod, Charles M. Gabrys, & Takeshi Oka.* 382, L51, 205-F1 (1991)
- ROGER, R. S.** IRAS 23545+6508, a Dissociating Star: Prototype for a New Observational Class? *P. E. Dewdney, R. S. Roger, C. R. Purton, & W. H. McCutcheon.* 370, 243, 50-C1 (1991)
- ROGERS, C.** Observations of HCO<sup>+</sup> in B335. *Tatsuhiko I. Hasegawa, C. Rogers, & Saeko Suzuki Hayashi.* 374, 177, 100-C1 (1991)
- ROGERS, F. J.** Opacities for the Solar Radiative Interior. *C. A. Iglesias & F. J. Rogers.* 371, 408, 65-C1 (1991)
- ROGERS, FORREST J.** Opacity Tables for Cepheid Variables. *Carlos A. Iglesias & Forrest J. Rogers.* 371, L73, 73-D1 (1991)
- ROGERS, R. D.** Compton Reflection in Active Galactic Nuclei and the Cosmic X-Ray Background. *R. D. Rogers & G. B. Field.* 370, L57, 59-A11 (1991)
- A Compton Reflection Model for the Cosmic X-Ray and Gamma-Ray Backgrounds. *R. D. Rogers & G. B. Field.* 378, L17, 157-C1 (1991)

- Relativistic Enhancement of the Compton-reflected Component in Active Galactic Nuclei.** *R. D. Rogers.* 383, 550, 221-B4 (1991)
- ROIS ORZA, C.** Far-Infrared Fourier Transform Spectroscopy of  $^{12}\text{C}^{18}\text{O}$ . *P. De Natale, M. Inguscio, C. Rois Orza, & L. R. Zink.* 370, L53, 53-G5 (1991)
- ROKKE, L.** See SMOOTH, G. E., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- ROMANI, ROGER W.** Limits on Cluster Binaries. *Roger W. Romani & Martin D. Weinberg.* 372, 487, 81-G5 (1991)
- ROMANISHIN, W.** See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- RONAN, R. S.** Wavelength Variation of  $p$ -Mode Intensity Fluctuations. *R. S. Ronan, J. W. Harvey, & T. L. Duval.* Jr. 369, 549, 44-E9 (1991)
- ROOD, H. J.** The Distance to the Coma Cluster Using the B-Band Tully-Fisher Relation. *M. Fukugita, S. Okamura, K. Tarusawa, H. J. Rood, & B. A. Williams.* 376, 8, 125-B9 (1991)
- ROOD, HERBERT J.** Superposition and Incompleteness Effects in Abell's Statistical Sample of Clusters. *Mitchell F. Struble & Herbert J. Rood.* 374, 395, 104-B5 (1991)
- A Compilation of Redshifts and Velocity Dispersions for Abell Clusters (Epoch 1991.2). *Mitchell F. Struble & Herbert J. Rood.* 77, 363, 49-F1 (1991)
- ROQUES, J. P.** See BARRET, D., et al. Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2.
- See BOUCHET, L., et al. SIGMA Discovery of Variable  $e^+e^-$  Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7-2942.
- See SUNYAEV, R., et al. Three Spectral States of 1E 1740.7-2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature.
- ROSEN, ALEXANDER.** Statistical Analysis of Power-Size-Redshift Distributions of Extragalactic Jets. *Alexander Rosen & Paul J. Wiita.* 371, 501, 67-F10 (1991)
- Beams Crossing a Galactic Halo-Intergalactic Medium Interface and the Size of Extragalactic Radio Sources: Erratum. *Alexander Rosen & Paul J. Wiita.* 372, 349, 78-C7 (1991) (Orig. paper in 330, 16, 90-B11 (1988))
- ROSEN, NATHAN.** Stability of a Collapsed Star in Bimetric General Relativity. II. *Amos Harpaz & Nathan Rosen.* 371, 254, 63-C9 (1991)
- Perturbations in a Singularity-free Cosmological Model. *Mark Israelit & Nathan Rosen.* 375, 463, 118-E1 (1991)
- ROSEN, P. A.** See KRISHER, T. P., et al. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of Voyager 2.
- ROSEN, SIMON.** Evidence for CNO Processed Material in the Accretion Disk of GP Comae. *T. R. Marsh, Keith Horne, & Simon Rosen.* 366, 535, 9-F1 (1991)
- ROSENBLATT, E.** See CAGANOFF, S., et al. Faint Object Spectrograph Spectroscopy of Resolved Structure in the Nucleus of NGC 1068. See HUTCHINGS, J. B., et al. First Results from the Goddard High-Resolution Spectrograph: Ultraviolet Spectra of a Starburst Knot in NGC 1068.
- ROSENBLATT, E. I.** See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- See BEAVER, E. A., et al. Far-Ultraviolet Spectroscopy of the Quasar UM 675 with the Faint Object Spectrograph on the *Hubble Space Telescope*.
- ROSENOVIST, JAN.** First Absolute Wind Measurements in the Middle Atmosphere of Mars. *Emmanuel Lellouch, Jeffrey J. Goldstein, Stephen W. Bougher, Gabriel Paubert, & Jan Rosengqvist.* 383, 401, 217-C5 (1991)
- ROSENWALD, R. D.** Application of the Continuous Orthonormalization and Adjoint Methods to the Computation of Solar Eigenfrequencies and Eigenfrequency Sensitivities. *R. D. Rosenwald & G. F. Rabaey.* 77, 97, 44-G1 (1991)
- ROSNER, R.** The Finite-Amplitude Behavior of the Joule Mode under Astrophysical Conditions. *G. Bodo, S. Massaglia, R. Rosner, & A. Ferrari.* 370, 398, 52-C1 (1991)
- Magnetic Confinement, Alfvén Wave Reflection, and the Origins of X-Ray and Mass-Loss "Dividing Lines" for Late-Type Giants and Supergiants. *R. Rosner, C.-H. An, Z. E. Musielak, R. L. Moore, & S. T. Suess.* 372, L91, 85-E5 (1991)
- The Diffuse Soft X-Ray Background As Seen with the *Einstein Observatory*. *G. Micela, F. R. Harnden, Jr., R. Rosner, S. Sciorino, & G. S. Vaiana.* 380, 495, 184-D1 (1991)
- ROSNER, ROBERT.** On Turbulent Diffusion of Magnetic Fields and the Loss of Magnetic Flux from Stars. *Samuel I. Vainshtein & Robert Rosner.* 376, 199, 127-D7 (1991)
- ROSS, RANDY R.** Comptonization of Gamma Rays by Cold Electrons. *Yueming Xu, Randy R. Ross, & Richard McCray.* 371, 280, 63-E11 (1991)
- ROSSANO, GEORGE S.** Near-Infrared Spectroscopy of the Planetary Nebula NGC 6572. *Richard J. Rudy, George S. Rossano, Peter Erwin, & R. C. Puetter.* 368, 468, 30-G13 (1991)
- The 0.46-1.3 Micron Spectrum of the Planetary Nebula BD +30°3639. *Richard J. Rudy, Ross D. Cohen, George S. Rossano, Peter Erwin, R. C. Puetter, & David K. Lynch.* 380, 151, 178-A1 (1991)
- Near-Infrared [Fe II] Emission of M82 Supernova Remnants: Implications for Tracing the Supernova Content of Galaxies. *Matthew A. Greenhouse, Charles E. Woodward, Harley A. Thronson, Jr., Richard J. Rudy, George S. Rossano, Peter Erwin, & R. C. Puetter.* 383, 164, 214-B1 (1991)
- The 1.0-1.3 Micron Spectrum of LkH $\alpha$  101. *Richard J. Rudy, Peter Erwin, George S. Rossano, & R. C. Puetter.* 383, 344, 216-D7 (1991)
- Rossi, L.** Diffuse Galactic Emission at Millimetric Wavelengths. *P. Andreani, G. Dall'Olgo, L. Martinis, L. Piccirillo, L. Pizzo, L. Rossi, & C. Venturino.* 375, 148, 112-G5 (1991)
- ROSSO, C.** The Coronal Dividing Line in the *ROSAT* X-Ray All-Sky Survey. *Bernhard Haisch, J. H. M. M. Schmitt, & C. Rosso.* 383, L15, 219-C1 (1991)
- ROTACIUC, V.** High-Resolution Imaging of Brackett- $\gamma$  and H $_2$  1-0 S(1) Emission in the Seyfert Galaxy NGC 1068. *V. Rotaciuc, A. Krabbe, M. Cameron, S. Drapatz, R. Genzel, A. Sternberg, & J. W. V. Storey.* 370, L23, 53-D6 (1991)
- A Cluster of He I Emission-Line Stars in the Galactic Center. *A. Krabbe, R. Genzel, S. Drapatz, & V. Rotaciuc.* 382, L19, 205-C1 (1991)
- ROTH, D. C.** See KRISHER, T. P., et al. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of *Voyager 2*.
- ROTH, J.** See MOULD, J. R., et al. The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. I. Southern Clusters.
- ROTH, KATHERINE C.** Discovery of Interstellar NH. *David M. Meyer & Katherine C. Roth.* 376, L49, 137-D1 (1991)
- Observations of Ca II Absorption along the Nearly Parallel Lines of Sight toward 3C 273 and SN 1991T. *David M. Meyer & Katherine C. Roth.* 383, L41, 226-B11 (1991)
- ROTHSCHILD, R. E.** A Model for the 35 Day Variations in the Pulse Profile of Hercules X-1. *J. A. Peterson, R. E. Rothschild, & D. E. Gruber.* 378, 696, 161-A11 (1991)
- ROTTLER, LEE.** Evidence for External Plasma around the K Dwarf Component of the Eclipsing Binary V471 Tauri. *Arthur Young, Lee Rottler, & Andrew Skumanich.* 378, L25, 157-D1 (1991)
- ROTTMAN, GARY J.** Systematic Radial Flows in the Chromosphere, Transition Region, and Corona of the Quiet Sun. *Donald M. Hassler, Gary J. Rottman, & Frank Q. Orrall.* 372, 710, 84-E1 (1991)
- ROULEAU, FRANÇOIS.** Shape and Clustering Effects on the Optical Properties of Amorphous Carbon. *François Rouleau & P. G. Martin.* 377, 526, 146-C3 (1991)
- ROUVELIOTIS, GEORGE.** Magnetohydrodynamics of an Impulsively Heated, Hard X-Ray Emitting Filament. *George Rouveliotis & A. Gordon Emslie.* 377, 685, 148-B9 (1991)

- Joule Heating as an Explanation for the Differential Emission Measure Structure and Systematic Redshifts in the Sun's Lower Transition Region. *George Roumeliotis.* 379, 392, 167-G9 (1991)
- ROUNTREE, JANET. Criteria for the Spectral Classification of B Stars in the Ultraviolet. *Janet Rountree & George Sonneborn.* 369, 515, 44-B5 (1991)
- ROWAN-ROBINSON, M. See SOIFER, B. T., et al. Near-Infrared Observations of the  $z \sim 2.3$  IRAS Source FSC 10214+4724.
- ROWLEY, N. Barrier Penetration at Astrophysical Energies. *N. Rowley & A. C. Merchant.* 381, 591, 198-B1 (1991)
- ROY, JEAN-RENÉ. Superbubble Blowout in the Giant H II Region NGC 2363? *Jean-René Roy, J. Boulesteix, Gilles Joncas, & B. Grundseth.* 367, 141, 13-F8 (1991)
- Possible Deflection of a Jet by Molecular Clouds in NGC 4258. *R. L. Plante, K. Y. Lo, Jean-René Roy, Pierre Martin, & Louis Noreau.* 381, 110, 190-D4 (1991)
- RUAN, KUI. Oxygen Abundances in Halo Stars. *Michael S. Bessell, Ralph S. Sutherland, & Kui Ruan.* 383, L71, 226-E6 (1991)
- RUBIN, R. H. Axisymmetric Model of the Ionized Gas in the Orion Nebula. *R. H. Rubin, J. P. Simpson, M. R. Haas, & E. F. Erickson.* 374, 564, 106-B12 (1991)
- RUBIN, ROBERT H. Far-Infrared Line and Continuum Observations of G0.095+0.012 and the E2 Thermal Radio Filament near the Galactic Center. *Edwin F. Erickson, Sean W. J. Colgan, J. P. Simpson, Robert H. Rubin, Mark Morris, & Michael R. Haas.* 370, L69, 59-C1 (1991)
- RUBIN, VERA C. Optical Properties and Dynamics of Galaxies in the Hickson Compact Groups. *Vera C. Rubin, Deidre A. Hunter, & W. Kent Ford, Jr.* 76, 153, 26-A1 (1991)
- RUBIO, M. A  $^{12}$ CO Survey of the Small Magellanic Cloud. *M. Rubio, G. Garay, J. Montani, & P. Thaddeus.* 368, 173, 25-C1 (1991)
- RUDAK, B. Dust from Early Galaxies and the X-Ray Background Radiation. *B. Rudak & P. Mészáros.* 371, 29, 60-D5 (1991)
- Spectral Signatures of the MeV-PeV Radiation from Accreting Neutron Stars. *B. Rudak & P. Mészáros.* 383, 269, 215-E3 (1991)
- RUDAK, BRONISLAW. Consequences of Relativistic Proton Injection in Active Galactic Nuclei Erratum. *Mitchell C. Begelman, Bronislaw Rudak, & Marek Sikora.* 370, 791, 58-D1 (1991) (Orig. paper in 362, 38, 169-E3 (1990))
- RUDAZ, S. On the Observability of the Gamma-Ray Line Flux from Dark Matter Annihilation. *S. Rudaz & F. W. Stecker.* 368, 406, 30-B5 (1991)
- RUDEN, STEVEN P. Star Formation and the Nature of Bipolar Outflows. *Frank H. Shu, Steven P. Ruden, Charles J. Lada, & Susana Lizano.* 370, L31, 53-E1 (1991)
- Nonlinear Evolution of Accretion Disks Induced by Radiative Feedback Processes. *K. R. Bell, D. N. C. Lin, & Steven P. Ruden.* 372, 633, 83-E7 (1991)
- The Dynamical Evolution of the Protosolar Nebula. *Steven P. Ruden & James B. Pollack.* 375, 740, 121-G11 (1991)
- RUDER, H. Testing Einstein's Theory of Gravity by Analyzing Lunar Laser Ranging Data. *J. Müller, M. Schneider, M. Soffel, & H. Ruder.* 382, L101, 211-E12 (1991)
- RUDERMAN, M. Stationary Accelerators around Keplerian Disks of Aligned Magnetized Collapsed Objects: Pair Production and Gamma-Ray Emission. *K. S. Cheng & M. Ruderman.* 373, 187, 88-C9 (1991)
- Neutron Star Crustal Plate Tectonics. II. Evolution of Radio Pulsar Magnetic Fields. *M. Ruderman.* 382, 576, 208-F4 (1991)
- Neutron Star Crustal Plate Tectonics. III. Cracking, Glitches, and Gamma-Ray Bursts. *M. Ruderman.* 382, 587, 208-G3 (1991)
- RUDNICK, L. Relativistic Electron Populations in Cassiopeia A. *M. Anderson, L. Rudnick, P. Leppik, R. Perley, & R. Braun.* 373, 146, 87-G4 (1991)
- RUDY, RICHARD J. Near-Infrared Spectroscopy of the Planetary Nebula NGC 6572. *Richard J. Rudy, George S. Rossano, Peter Erwin, & R. C. Puettner.* 368, 468, 30-G13 (1991)
- The 0.46-1.3 Micron Spectrum of the Planetary Nebula BD +30°3639. *Richard J. Rudy, Ross D. Cohen, George S. Rossano, Peter Erwin, R. C. Puettner, & David K. Lynch.* 380, 151, 178-A1 (1991)
- Near-Infrared [Fe II] Emission of M82 Supernova Remnants: Implications for Tracing the Supernova Content of Galaxies. *Matthew A. Greenhouse, Charles E. Woodward, Harley A. Thronson, Jr., Richard J. Rudy, George S. Rossano, Peter Erwin, & R. C. Puettner.* 383, 164, 214-B1 (1991)
- The 1.0-1.3 Micron Spectrum of LkHα 101. *Richard J. Rudy, Peter Erwin, George S. Rossano, & R. C. Puettner.* 383, 344, 216-D7 (1991)
- RUFFOLO, D. Interplanetary Transport of Decay Protons from Solar Flare Neutrons. *D. Ruffolo.* 382, 688, 210-B12 (1991)
- RUIZ, MARIA TERESA. ESO 207-61: A Brown Dwarf Candidate in the Hyades Moving Group. *Maria Teresa Ruiz, Marianne Y. Takamiya, & Miguel Roth.* 367, L59, 22-C7 (1991)
- RUIZ-LAPUENTE, P. SN 1988A in M58: Departure from  $^{56}\text{Co}$  Decay 700 Days after Explosion. *P. Ruiz-Lapuente, M. Kidger, G. Gómez, R. Canal, & R. López.* 378, L41, 162-E1 (1991)
- RULISON, AARON J. Ablation of Silicate Particles in High-Speed Continuum and Transition Flow with Application to the Collection of Interplanetary Dust Particles. *Aaron J. Rulison, Richard C. Flagan, Thomas J. Ahrens, & Wayne F. Miller.* 371, 432, 65-E5 (1991)
- RUMITZ, M. A Survey of the 158 Micron [C II] Fine-Structure Line in the Central 50 Parsecs of The Galaxy. *A. Poglitsch, G. J. Stacey, N. Geis, M. Haggerty, J. Jackson, M. Rumitz, R. Genzel, & C. H. Townes.* 374, L33, 110-B5 (1991)
- RUPEN, MICHAEL P. Spectra of Two Very Old Supernovae: SN 1986J and SN 1980K. *Bruno Leibundgut, Robert P. Kirshner, Philip A. Pinto, Michael P. Rupen, R. Chris Smith, James E. Gunn, & Donald P. Schneider.* 372, 531, 82-D1 (1991)
- Molecular Gas in Elliptical Galaxies. *Joanna F. Lees, G. R. Knapp, Michael P. Rupen, & T. G. Phillips.* 379, 177, 165-B11 (1991)
- RUPP, G. A Measurement of the  $^{22}\text{Ne}(n, \gamma)^{23}\text{Ne}$  Capture Cross Section at a Stellar Temperature of  $kT = 25$  keV. *Hermann Beer, G. Rupp, F. Voss, & F. Käppeler.* 379, 420, 168-C1 (1991)
- RUSSELL, A. P. G. CO J = 3-2 and J = 2-1 Observations of NGC 7027. *P. A. Jaminet, W. C. Danchi, E. C. Sutton, A. P. G. Russell, Göran Sandell, J. H. Bieging, & D. Wilner.* 380, 461, 184-A4 (1991)
- First Observations of the CO J = 6-5 Transition in Starburst Galaxies. *A. I. Harris, R. E. Hills, J. Stutzki, U. U. Graf, A. P. G. Russell, & R. Genzel.* 382, L75, 211-C7 (1991)
- RUSSELL, ADRIAN P. G. NGC 1333 IRAS 4: A Very Young, Low-Luminosity Binary System. *Göran Sandell, Colin Aspin, William D. Duncan, Adrian P. G. Russell, & E. Ian Robson.* 376, L17, 130-C1 (1991)
- RUSTAMBEKIAN, S. S. A Cool Supergiant with Anomalous Behavior of the 2800 Mg II Doublet. *G. A. Gurzadyan, Y. Kondo, S. S. Rustambekyan, Yervant Terzian, & Mario R. Perez.* 378, 298, 154-F1 (1991)
- RUTTEN, RENE G. M. See DUNCAN, DOUGLAS K., et al. Ca II H and K Measurements Made at Mount Wilson Observatory, 1966-1983.
- RYAN, JAMES M. On the Transport and Acceleration of Solar Flare Particles in a Coronal Loop. *James M. Ryan & Martin A. Lee.* 368, 316, 26-A7 (1991)
- RYAN, SEAN G. Population Studies. XI. The Extended Disk, Halo Configuration. *John E. Norris & Sean G. Ryan.* 380, 403, 183-C6 (1991)
- RYASSNY, V. G. See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- RYAZHSKAYA, O. G. See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- RYBA, M. F. High-Precision Timing of Millisecond Pulsars. I. Astrometry and Masses of the PSR 1855+09 System. *M. F. Ryba & J. H. Taylor.* 371, 739, 70-F9 (1991)
- High-Precision Timing of Millisecond Pulsars. II. Astrometry, Orbital Evolution, and Eclipses of PSR 1957+20. *M. F. Ryba & J. H. Taylor.* 380, 557, 185-B7 (1991)
- RYBICKI, G. B. Instabilities in Line-driven Stellar Winds. V. Effect of an Optically Thick Continuum. *S. P. Owocki & G. B. Rybicki.* 368, 261, 26-C11 (1991)
- RYDEN, BARBARA S. Compression of Dark Halos by Baryon Infall: Self-similar Solutions. *Barbara S. Ryden.* 370, 15, 47-C1 (1991)
- Phase Shifts in Gravitationally Evolving Density Fields. *Barbara S. Ryden & Mirt Gramann.* 383, L33, 226-B1 (1991)

- RYTER, C. Very Small Grains and the Infrared Colors of Galaxies. *G. Helou, C. Ryter, & B. T. Soifer.* 376, 505, 132-F6 (1991)
- RYU, DONGSU. The Dynamic Instability of Adiabatic Blast Waves. *Dongsu Ryu & Ethan T. Vishniac.* 368, 411, 30-B12 (1991)
- RYUTOVA, M. Propagation of Magnetoacoustic Waves in the Solar Atmosphere with Random Inhomogeneities of Density and Magnetic Fields. *M. Ryutova, M. Kaisig, & T. Tajima.* 380, 268, 179-D1 (1991)
- SAAR, STEVEN H. Broad-Band Linear Polarization in Cool Stars. I. Models and Spatial Effects for Magnetic and Scattering Regions. *Juhani Huovelin & Steven H. Saar.* 374, 319, 102-B1 (1991)
- Rotation and Emission Lines in Stars and Accretion Disks. *Keith Horne & Steven H. Saar.* 374, L55, 110-D6 (1991)
- SAVEDRA, O. See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- SABA, J. L. R. See NITTA, N., et al. Coronal Magnetic Structures Observing Campaign. I. Simultaneous Microwave and Soft X-Ray Observations of Active Regions at the Solar Limb.
- SABA, JULIA L. R. Coronal Dynamics of a Quiescent Active Region. *Julia L. R. Saba & Keith T. Strong.* 375, 789, 122-D9 (1991)
- SACCO, B. See MASSARO, E., et al. Detection of a Feature at 0.44 MeV in the Crab Pulsar Spectrum with FIGARO II: A Redshifted Positron Annihilation Line?
- SACKETT, PENNY D. The Dark Halo of the Polar-Ring Galaxy NGC 4650A: Erratum. *Penny D. Sackett & Linda S. Sparke.* 371, 443, 65-F3 (1991) (Orig. paper in 361, 408, 163-B11 (1990))
- SACKMANN, I.-JULIANA. Mixing Length and Opacity Effects: Deep Convective Envelopes on the Asymptotic Giant Branch. *I.-Juliana Sackmann & Arnold I. Boothroyd.* 366, 529, 9-E7 (1991)
- Our Sun. II. Early Mass Loss of  $0.1 M_{\odot}$  and the Case of the Missing Lithium. *Arnold I. Boothroyd, I.-Juliana Sackmann, & William A. Fowler.* 377, 318, 141-G11 (1991)
- SADDLEMYER, L. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- SADLER, ELAINE. Testing the Gravitational Field in Elliptical Galaxies: NGC 5077. *Francesco Bertola, Daniela Bettoni, John Danziger, Elaine Sadler, Linda Sparke, & Tim de Zeeuw.* 373, 369, 92-E10 (1991)
- SADUN, A. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- SADUN, ALBERTO C. Heavy, Overpressured Jets and the Radio Source Hercules A. *David L. Meier, Alberto C. Sadun, & Kevin R. Lind.* 379, 141, 164-F9 (1991)
- SAFFER, REX A. The Isolated Massive DA White Dwarf GD 50. *P. Bergeron, K. M. Kidder, J. B. Holberg, James Liebert, F. Wesemael, & Rex A. Saffer.* 372, 267, 77-C5 (1991)
- SAGAR, ROBIN P. On the Evaluation of the Fermi-Dirac Integrals. *Robin P. Sagar.* 376, 364, 129-D8 (1991)
- SAGE, LESLIE J. Star Formation and the Molecular Content of IC 342. *Leslie J. Sage & P. M. Solomon.* 380, 392, 183-B7 (1991)
- SAHADE, JORGE. Wind Collision Effects in the Early-Type Close Binaries HD 47129 and AO Cassiopeiae. *Jorge Sahade & Estela Brandi.* 379, 706, 173-E1 (1991)
- SAITO, SHUJI. Laboratory Observation of the  $^3P_1 - ^3P_0$  Transition of the Neutral Carbon Atom by Submillimeter-Wave Absorption Spectroscopy. *Satoshi Yamamoto & Shuji Saito.* 370, L103, 59-F7 (1991)
- SAIZAR, PEDRO. PW Vulpeculae: A Nova with Nearly Solar Abundances. *Pedro Saizar, Sumner Starrfield, Gary J. Ferland, R. Mark Wagner, James W. Truran, Scott J. Kenyon, Warren M. Sparks, Robert E. Williams, & L. L. Stryker.* 367, 310, 15-G11 (1991)
- SAKAO, T. See NAGASE, F., et al. Cyclotron Line Features in the Spectrum of the Transient X-Ray Pulsar X0115+634.
- SAKATA, A. Trapped H<sub>2</sub>O in SiO Condensate: An Explanation for the 3 Micron Band Observed toward the Galactic Center. *S. Wada, A. Sakata, & A. T. Tokunaga.* 375, L17, 117-C1 (1991)
- High-Resolution Spectra of the 3.29 Micron Interstellar Emission Feature: A Summary. *A. T. Tokunaga, K. Sellgren, R. G. Smith, T. Nagata, A. Sakata, & Y. Nakada.* 380, 452, 183-G8 (1991)
- SAKEN, J. See EDELSON, R. A., et al. Rapid Ultraviolet Variability in the BL Lacertae Object PKS 2155-304.
- SALAMON, M. H. See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- SALOTTI, L. See BARRET, D., et al. Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2.
- SALPETER, EDWIN E. The Joint Far-Infrared–Optical Luminosity Function for Spiral Galaxies and Data for the Abell 400 and Cancer Clusters. *Edwige Corbelli, Edwin E. Salpeter, & John M. Dickey.* 370, 49, 47-F4 (1991)
- Roseland and Planck Mean Opacities of a Zero-Metallicity Gas. *Paolo Lenzini, David F. Chernoff, & Edwin E. Salpeter.* 76, 759, 35-B13 (1991)
- Galaxy Pairs in Redshift Catalogs as a Probe of Dark Matter. *Jane C. Charlton & Edwin E. Salpeter.* 375, 517, 119-C1 (1991)
- SALUCCI, PAOLO. The Universal Galaxy Rotation Curve. *Massimo Persic & Paolo Salucci.* 368, 60, 23-G9 (1991)
- Background Correlation Functions from Galaxy Rotation Curves. *Stefano Borgani, Silvio A. Bonometto, Massimo Persic, & Paolo Salucci.* 374, 20, 98-C7 (1991)
- The Dark Matter Content of Spiral Galaxies. *Paolo Salucci, Keith M. Ashman, & Massimo Persic.* 379, 89, 164-B1 (1991)
- SALVADORI, L. 3C 345: Is the Variability of Quasars Nonlinear? *R. Vio, S. Cristiani, O. Lessi, & L. Salvadori.* 380, 351, 182-F1 (1991)
- SVATI, M. See MASSARO, E., et al. Detection of a Feature at 0.44 MeV in the Crab Pulsar Spectrum with FIGARO II: A Redshifted Positron Annihilation Line?
- SAMBURNA, R. M. X-Ray to Infrared Observations of the AM Herculis System E1405–451 (V834 Centauri). *R. M. Sambruna, L. Chiappetti, A. Treves, J. M. Bonnet-Bidaud, P. Bouchet, L. Maraschi, C. Moi, & M. Mouchet.* 374, 744, 108-C10 (1991)
- SANAHUA, BLAI. A Straight Gravitational Image in Abell 2390: A Striking Case of Lensing by a Cluster of Galaxies. *Roser Pelló, Jean-François Le Borgne, Geneviève Soucail, Yannick Mellier, & Blai Sanahua.* 366, 405, 7-G9 (1991)
- SANCHEZ-PONS, F. See QUIRRENBACH, A., et al. Correlated Radio and Optical Variability in the BL Lacertae Object 0716+714.
- SANDAGE, ALLAN. The Surface Brightness Test for the Expansion of the Universe. III. Reduction of Data for the Several Brightest Galaxies in Clusters to Standard Conditions and a First Indication That the Expansion Is Real. *Allan Sandage & Jean-Marc Perelmuter.* 370, 455, 54-B1 (1991)
- The Small-Scale Clustering Properties of Dwarf Galaxies. *J. Patricia Vader & Allan Sandage.* 379, L1, 169-A8 (1991)
- NGC 4286 and NGC 3377A: Galaxies with Mixed Morphologies between the Dwarf Im and dE/dSO Types. *Allan Sandage & G. Lyle Hoffman.* 379, L45, 175-A11 (1991)
- SANDBERG, V. D. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- SANDELL, GÖRAN. NGC 1333 IRAS 4: A Very Young, Low-Luminosity Binary System. *Göran Sandell, Colin Aspin, William D. Duncan, Adrian P. G. Russell, & E. Ian Robson.* 376, L17, 130-C1 (1991)
- CO J = 3–2 and J = 2–1 Observations of NGC 7027. *P. A. Jamine, W. C. Danchi, E. C. Sutton, A. P. G. Russell, Göran Sandell, J. H. Bieging, & D. Wilner.* 380, 461, 184-A4 (1991)
- Are FU Orionis Stars Younger than T Tauri Stars? Submillimeter Constraints on Circumstellar Disks. *David A. Weintraub, Göran Sandell, & William D. Duncan.* 382, 270, 203-E8 (1991)
- SANDERS, D. B. Millimeter Interferometer Observations of Infrared Luminous Galaxies: NGC 828 and NGC 6240. *Z. Wang, N. Z. Scoville, & D. B. Sanders.* 368, 112, 24-D9 (1991)
- Molecular Gas in Luminous Infrared Galaxies. *D. B. Sanders, N. Z. Scoville, & B. T. Soifer.* 370, 158, 49-B1 (1991)
- High-Resolution CO Observations of Luminous Infrared Galaxies with Large  $L_{\text{IR}}/L_B$  Ratios: IRAS 10173+0828, Zw 049.057, IRAS 17208–0014. *P. Planesas, I. F. Mirabel, & D. B. Sanders.* 370, 172, 49-C5 (1991)
- CO (3–2) Mapping and Gas Excitation in the Core of M82. *R. P. J. Tilanus, L. J. Tacconi, E. C. Sutton, S. Zhou, D. B. Sanders, C. G.*

- Wynn-Williams, K. Y. Lo, & S. A. Stephens. 376, 500, 132-E13 (1991)
- SANDERS, W. T. Limits on the Density of Neutral Gas within 100 Parsecs from Observations of the Soft X-Ray Background. *M. Juda, J. J. Bloch, B. C. Edwards, D. McCammon, W. T. Sanders, S. L. Snowden, & J. Zhang.* 367, 182, 14-C8 (1991)
- SANDFORD, S. A. The Interstellar C-H Stretching Band near 3.4 Microns: Constraints on the Composition of Organic Material in the Diffuse Interstellar Medium. *S. A. Sandford, L. J. Allamandola, A. G. G. M. Tielens, K. Sellgren, M. Tapia, & Y. Pendleton.* 371, 607, 69-B1 (1991)
- 10 Micron Spectra of Protostars and the Solid Methanol Abundance. *W. A. Schutte, A. G. G. M. Tielens, & S. A. Sandford.* 382, 523, 208-A11 (1991)
- SANDFORD, SCOTT A. The Spectrum of NGC 7027 from 3080 to 2630 Wavenumbers (3.25–3.80 Microns): Detection of New Atomic and Molecular Hydrogen Lines and New Constraints on the Chemical Sidegroups on Polycyclic Aromatic Hydrocarbons. *Scott A. Sandford.* 376, 599, 133-G1 (1991)
- SANDULEAK, N. The Case Low-Dispersion Northern Sky Survey. XII. A Region in Southern Canes Venatici. *Peter Pesch, N. Sanduleak, & C. B. Stephenson.* 76, 1043, 40-B1 (1991)
- SANSOM, A. E. See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- SANTOS, J. F. C., JR. Detection of the Helium Flash Gap in the Integrated ( $U - B$ ) versus ( $B - V$ ) Diagram for 624 Large Magellanic Cloud Clusters. *E. Bica, J. J. Clariá, H. Dottori, J. F. C. Santos, Jr., & A. Piatti.* 381, L51, 199-C7 (1991)
- SANTOS, N. O. Diffusion Processes in the Collapse of a Radiating Spherical Body. *R. Chan, L. Herrera, J. A. F. Pacheco, & N. O. Santos.* 382, 255, 203-D1 (1991)
- SAPRU, M. L. Possible Detection of TeV Gamma Rays from AM Herculis. *C. L. Bhat, R. K. Kaul, H. S. Rawat, V. K. Senecha, R. C. Rannou, M. L. Sapru, A. K. Tickoo, & H. Razdan.* 369, 475, 43-E12 (1991)
- SARAZIN, CRAIG L. Evidence for Environmental Effects on Early-Type Galaxy X-Ray Halos. *Raymond E. White III & Craig L. Sarazin.* 367, 476, 19-C9 (1991)
- Stripped Interstellar Gas in Cluster Cooling Flows. *Noam Soker, Joel N. Bregman, & Craig L. Sarazin.* 368, 341, 29-C10 (1991)
- Optical Coronal Emission Lines from Cooling Flows in Elliptical Galaxies and Galaxy Clusters. *Craig L. Sarazin & Christopher M. Graney.* 375, 532, 119-D3 (1991)
- SARGENT, A. I. The Molecular Structure around HL Tauri. *A. I. Sargent & S. V. W. Beckwith.* 382, L31, 205-D6 (1991)
- SARGENT, ANNEILA I. Particle Emissivity in Circumstellar Disks. *Steven V. W. Beckwith & Anneila I. Sargent.* 381, 250, 192-B1 (1991)
- SARGENT, WALLACE L. W. Southern Sky Redshift Survey: The Catalog. *L. Nicolaci da Costa, Paulo S. Pellegrini, Marc Davis, Avery Meiksin, Wallace L. W. Sargent, & John L. Tonry.* 75, 935, 15-B1 (1991)
- Emission-Line and Continuum Properties of 92 Bright QSOs: Luminosity Dependence and Differences between Radio-selected and Optically Selected Samples. *Charles C. Steidel & Wallace L. W. Sargent.* 382, 433, 207-A1 (1991)
- SARMA, M. B. K. Spin-up of the White Dwarf in the Intermediate Polar 3A 0729+103. *Jyoti Singh, P. C. Agrawal, K. M. V. Apparao, P. Vivekananda Rao, & M. B. K. Sarma.* 380, 208, 178-E11 (1991)
- SASAKI, MISAO. Constraints on Open Universe Models from Quadrupole Anisotropy of the Cosmic Microwave Background. *Naoteru Gouda, Naoshi Sugiyama, & Misao Sasaki.* 372, L49, 85-B1 (1991)
- SASLAW, WILLIAM C. The Scale Dependence of Galaxy Distribution Functions. *William C. Saslaw & Philippe Crane.* 380, 315, 182-C1 (1991)
- SASSELOV, DIMITAR D. Period Changes and Evolution in RV Tauri Stars. *John R. Percy, Dimitar D. Sasselov, Amy Alfred, & Greg Scott.* 375, 691, 121-C7 (1991)
- SATO, KATSUHIKO. Rayleigh-Taylor Instability in the Asymmetric Supernova Explosion. *Shoichi Yamada & Katsuhiiko Sato.* 382, 594, 208-G12 (1991)
- SAVAGE, BLAIR D. Ultraviolet Interstellar Absorption toward HD 156359, a Halo Star at 11 Kiloparsecs in the Direction  $b = 329^\circ$  and  $b = -15^\circ$ . *Kenneth R. Sembach, Blair D. Savage, & Derck Massa.* 372, 81, 75-A11 (1991)
- Neutral Hydrogen in the Outer Galaxy. *Athanassios Diplas & Blair D. Savage.* 377, 126, 139-E5 (1991)
- First Results from the Goddard High-Resolution Spectrograph: The Galactic Halo and the Ly $\alpha$  Forest at Low Redshift in 3C 273. *Simon L. Morris, Ray J. Weymann, Blair D. Savage, & Ronald L. Gilliland.* 377, L21, 143-C11 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Element Abundances as a Function of Velocity in the Neutral Gas toward  $\xi$  Persei. *Blair D. Savage, Jason A. Cardelli, Frederick C. Bruhwiler, Andrew M. Smith, Dennis C. Ebbets, & Kenneth R. Sembach.* 377, L53, 143-F6 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Elemental Abundances in the Diffuse Clouds toward  $\xi$  Persei. *Jason A. Cardelli, Blair D. Savage, Frederick C. Bruhwiler, Andrew M. Smith, Dennis C. Ebbets, Kenneth R. Sembach, & Ulysses Sofia.* 377, L57, 143-F11 (1991)
- First Results from the Goddard High-Resolution Spectrograph: C I, Si, and CO toward  $\xi$  Persei and the Physical Conditions in Diffuse Clouds. *Andrew M. Smith, Frederick C. Bruhwiler, David L. Lambert, Blair D. Savage, Jason A. Cardelli, Dennis C. Ebbets, Cheng-Hsuan Lyu, & Yaron Sheffer.* 377, L61, 143-G1 (1991)
- The Analysis of Apparent Optical Depth Profiles for Interstellar Absorption Lines. *Blair D. Savage & Kenneth R. Sembach.* 379, 245, 166-B5 (1991)
- Interstellar Gas Phase Abundance of Carbon, Oxygen, Nitrogen, Copper, Gallium, Germanium, and Krypton toward  $\zeta$  Ophiuchi. *Jason A. Cardelli, Blair D. Savage, & Dennis C. Ebbets.* 383, L23, 219-D1 (1991)
- SAVAGE, MARTIN J. Neutrino Oscillations and the Leptonic Charge of the Universe. *Martin J. Savage, Robert A. Malaney, & George M. Fuller.* 368, 1, 23-B1 (1991)
- SAVARIA, P. White Dwarf and Neutron Star Interior Solutions in the Nonsymmetric Gravitational Theory. *L. M. Campbell, J. W. Moffat, & P. Savaria.* 372, 241, 77-A1 (1991)
- SAWYER, S. R. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- SAXTON, R. D. See KII, T., et al. X-Ray Continuum and Evidence for an Iron Emission Line from the Quasar E1821+643.
- SCARAMELLA, R. The Mass Distribution of Groups and Clusters of Galaxies. *A. Cavaliere, S. Colafrancesco, & R. Scaramella.* 380, 15, 176-C1 (1991)
- SCARAMELLA, ROBERTO. Non-Gaussian Temperature Fluctuations in the Cosmic Microwave Background Sky from a Random Gaussian Density Field. *Roberto Scaramella & Nicola Vittorio.* 375, 439, 118-C1 (1991)
- The Distribution of Clusters of Galaxies within  $300 \text{ Mpc } h^{-1}$  and the Crossover to an Isotropic and Homogeneous Universe. *Roberto Scaramella, Giampaolo Vettolani, & Giovanni Zamorani.* 376, L1, 130-A7 (1991)
- SCARSI, L. See MASSARO, E., et al. Detection of a Feature at 0.44 MeV in the Crab Pulsar Spectrum with FIGARO II: A Redshifted Positron Annihilation Line?
- SCHACHTER, JONATHAN. Bowen Fluorescence in AM Herculis Stars. *Jonathan Schacter, Alexei V. Filippenko, Steven M. Kahn, & Frits B. S. Paerels.* 373, 633, 95-G4 (1991)
- SCHAFFER, RICHARD. Nonlinear Matter Clustering Properties of a Cold Dark Matter Universe. *François R. Bouchet, Richard Schaeffer, & Marc Davis.* 383, 19, 212-C7 (1991)
- SCHARMER, G. B. High-Resolution Spectra of Solar Magnetic Features. II. Magnetic Fields of Umbral Brightenings. *Bruce W. Lites, Thomas A. Bida, A. Johannesson, & G. B. Scharmer.* 373, 683, 96-D11 (1991)
- SCHATTEN, K. What Maintains the Zonal Circulation in Planetary Atmospheres? *H. G. Mayr, K. L. Chan, I. Harris, & K. Schatten.* 367, 361, 16-E1 (1991)
- SCHATTEN, KENNETH H. On the Contrast of Facular Hillocks in the Infrared. *Kenneth H. Schatten & Hans G. Mayr.* 372, 728, 84-F7 (1991)

- SCHECTER, PAUL L. Radial Velocities of 26 Northern Milky Way Cepheids. *Mark R. Metzger, John A. R. Caldwell, James K. McCarthy, & Paul L. Schechter*. 76, 803, 35-G3 (1991)
- SCHEICK, XANIA. Does SV Centauri Harbor an Accretion Disk? *Albert P. Linnell & Xania Scheick*. 379, 721, 173-F7 (1991)
- SCHERRER, ROBERT J. Seeded Hot Dark Matter Models for Large-Scale Structure. *Jens V Villumsen, Robert J. Scherrer, & Edmund Bertschinger*. 367, 37, 12-D11 (1991)
- Comparison of Likely Candidate Models for Abell Cluster Structures against the Observed Distribution. *David J. Batuski, Adrian L. Melott, Robert J. Scherrer, & Edmund Bertschinger*. 367, 393, 18-C11 (1991)
- A Quantitative Measure of Phase Correlations in Density Fields. *Robert J. Scherrer, Adrian L. Melott, & Sergei F. Shandarin*. 377, 29, 138-D5 (1991)
- Statistics of Primordial Density Perturbations from Discrete Seed Masses. *Robert J. Scherrer & Edmund Bertschinger*. 381, 349, 195-B1 (1991)
- Seeded Hot Dark Matter Models for Large-Scale Structure: Erratum. *Jens V Villumsen, Robert J. Scherrer, & Edmund Bertschinger*. 381, 601, 198-C1 (1991) (Orig. paper in 367, 37, 12-D11 (1991))
- SCHILD, R. The CfA Einstein Observatory Extended Deep X-Ray Survey. *F. A. Primini, S. S. Murray, J. Huchra, R. Schild, R. Burg, & R. Giacconi*. 374, 440, 104-E12 (1991)
- The Einstein Observatory Extended Medium-Sensitivity Survey. II. The Optical Identifications. *John T. Stocke, Simon L. Morris, I. M. Gioia, T. Maccacaro, R. Schild, A. Wolter, Thomas A. Fleming, & J. Patrick Henry*. 76, 813, 36-B1 (1991)
- SCHILD, RUDY E. The Luminosity Function and Cosmological Evolution of X-Ray-selected BL Lacertae Objects. *Simon L. Morris, John T. Stocke, Isabella M. Gioia, Rudy E. Schild, Anna Wolter, Tommaso Maccacaro, & Roberto Della Ceca*. 380, 49, 176-F1 (1991)
- SCHINDLER, K. Magnetic Field-aligned Electric Potentials in Nonideal Plasma Flows. *K. Schindler, M. Hesse, & J. Birn*. 380, 293, 179-G9 (1991)
- SCHINDLER, STEPHEN M. Coded-Aperture Imaging of the Galactic Center Region at Gamma-Ray Energies. *Walter R. Cook, John M. Grunsfeld, William A. Heindl, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone*. 372, L75, 85-D1 (1991)
- SCHLICKEISER, R. Three-dimensional Models of a Galactic Wind Expansion with Ellipsoidal Geometry. I. The Hydrodynamical Test Case. *H. Fichtner, W. Neutsch, H. J. Fahr, & R. Schlickeiser*. 371, 98, 61-C9 (1991)
- SCHLOEBER, F. PETER. Molecular Outflows Associated with Young Stellar Objects in the L1641 Region of Orion. *James A. Morgan, F. Peter Schloerb, Ronald L. Snell, & John Bally*. 376, 618, 134-A12 (1991)
- SCHMELZ, J. T. See NITTA, N., et al. Coronal Magnetic Structures Observing Campaign. I. Simultaneous Microwave and Soft X-Ray Observations of Active Regions at the Solar Limb.
- SCHMELZ, JOAN T. Multi-Wave Band SMM-VLA Observations of an M2 Flare and an Associated Coronal Mass Ejection. *Robert F. Willson, Joan T. Schmelz, Raymond D. Gonzalez, Kenneth R. Lang, & Kermit L. Smith*. 378, 360, 155-D6 (1991)
- SCHMIDT, GARY D. Synchronization of the Magnetic Nova V1500 Cygni. *Gary D. Schmidt & H. S. Stockman*. 371, 749, 70-G7 (1991)
- X Marks the Spot: Distribution and Excitation of Unidentified Molecules in the Red Rectangle. *Gary D. Schmidt & Adolf N. Witt*. 383, 698, 222-G12 (1991)
- SCHMIDTKE, P. C. The Near-Infrared Spectra of Low-Mass X-Ray Binaries and Related Objects. *A. P. Cowley, P. C. Schmidke, D. Crampton, J. B. Hutchings, & M. Bolte*. 373, 228, 88-G1 (1991)
- See COWLEY, A. P., et al. Discovery of a Long-Term Periodic Variation in LMX X-3.
- SCHMITT, J. H. M. M. The Coronal Dividing Line in the ROSAT X-Ray All-Sky Survey. *Bernhard Haisch, J. H. M. M. Schmitt, & C. Rosso*. 383, L15, 219-C1 (1991)
- SCHMITT, JUERGEN H. M. M. Digging in the Coronal Graveyard: A ROSAT Observation of the Red Giant Arcturus. *Thomas R. Ayres, Thomas A. Fleming, & Juergen H. M. M. Schmitt*. 376, L45, 137-C7 (1991)
- SCHMUTZ, W. Wolf-Rayet Stars as Starting Points or as Endpoints of the Evolution of Massive Stars? *H. J. G. L. M. Lamers, A. Maeder, W. Schmutz, & J. P. Cassinelli*. 368, 538, 31-F12 (1991)
- SCHMUTZ, WERNER. Non-LTE Analysis of the Ofpe/WN9 Star HDE 269227 (R84). *Werner Schmutz, Claus Leitherer, Ivan Hubeny, Manfred Vogel, Wolf-Rainer Hamann, & Ulf Wessolowski*. 372, 664, 84-A1 (1991)
- SCHNEIDER, D. P. The Ultraviolet Absorption Spectrum of 3C 273. *J. N. Bahcall, B. T. Jannuzi, D. P. Schneider, G. F. Hartig, R. Bohlin, & V. Junkkarinen*. 377, L5, 143-B6 (1991)
- SCHNEIDER, DONALD P. See HOLTZMAN, JON A., et al. Stellar Photometry with the Hubble Space Telescope Wide-Field/Planetary Camera: A Progress Report.
- See LAUER, TOD R., et al. The Postcollapse Core of M15 Imaged with the HST Planetary Camera.
- Spectra of Two Very Old Supernovae: SN 1986J and SN 1980K. *Bruno Leibundgut, Robert P. Kirshner, Philip A. Pinto, Michael P. Rupen, R. Chris Smith, James E. Gunn, & Donald P. Schneider*. 372, 531, 82-D1 (1991)
- SCHNEIDER, M. Testing Einstein's Theory of Gravity by Analyzing Lunar Laser Ranging Data. *J. Müller, M. Schneider, M. Soffel, & H. Ruder*. 382, L101, 211-E12 (1991)
- SCHNEIDER, N. M. The Structure of Io's Corona. *N. M. Schneider, D. M. Hunten, W. K. Wells, A. B. Schultz, & U. Fink*. 368, 298, 27-G1 (1991)
- SCHNEIDER, STEPHEN E. Northern Dwarf and Low Surface Brightness Galaxies. IV. The Large-Scale Space Distribution. *Trinh X. Thuan, Jean-Michel Alimi, J. Richard Gott III, & Stephen E. Schneider*. 370, 25, 47-D1 (1991)
- SCHOELOPPF, R. J. Detection of Coherent 7.6 Hz Oscillations during a Burst from Aquila X-1. *R. J. Schoelkopf & R. L. Kelley*. 375, 696, 121-D1 (1991)
- SCHOENFELD, WILLIAM G. Electric Field Strengths from the Solar 12 Micron Lines. *Edward S. Chang & William G. Schoenfeld*. 383, 450, 217-G9 (1991)
- SCHOLZ, T. T. Collisional Rates and Cooling within Atomic Hydrogen Plasmas. *T. T. Scholz & H. R. J. Walters*. 380, 302, 180-A5 (1991)
- SCHOMBERT, J. M. Far-Infrared Counterpart to the Optical and H I Plume in the Leo Triplet of Galaxies: NGC 3623, NGC 3627, and NGC 3628. *D. H. Hughes, P. N. Appleton, & J. M. Schombert*. 370, 176, 49-C11 (1991)
- The LkHα 101 Infrared Cluster. *M. Barsony, J. M. Schombert, & K. Kis-Halas*. 379, 221, 165-G1 (1991)
- SCHOMBERT, JAMES M. Narrow-Band Photometry and the Evolution of Galaxies. III. The Intermediate-Redshift Sample. *Karl D. Rakos, James M. Schombert, & Tobias J. Kreidl*. 377, 382, 144-E7 (1991)
- SCHOMMER, R. A. See MOULD, J. R., et al. The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. I. Southern Clusters.
- SCHOMMER, ROBERT A. A Study of Star Formation in the Disks of Sa Galaxies. *Nelson Caldwell, Robert Kennicutt, Andrew C. Phillips, & Robert A. Schommer*. 370, 526, 54-G12 (1991)
- SCHRADER, CHARLES. Solar Gravitational Redshift from the Infrared Oxygen Triplet. *James C. LoPresto, Charles Schrader, & A. Keith Pierce*. 376, 757, 135-F11 (1991)
- SCHRAMM, DAVID N. The Shock Process and Light-Element Production in Supernova Envelopes. *Lawrence E. Brown, David S. Dearborn, David N. Schramm, Jon T. Larsen, & Shin Kurokawa*. 371, 648, 69-F1 (1991)
- Primordial Nucleosynthesis Redux. *Terry P. Walker, Gary Steigman, David N. Schramm, Keith A. Olive, & Ho-Shik Kang*. 376, 51, 125-F1 (1991)
- SCHRAMM, S. Pyconuclear Fusion Rates: Erratum. *S. Schramm & S. E. Koonin*. 377, 343, 142-B12 (1991) (Orig. paper in 365, 296, 210-B1 (1990))
- SCHROEDER, DANIEL. The Imaging Performance of the Hubble Space Telescope. *Christopher J. Burrows, Jon A. Holtzman, S. M. Faber, Pierre Y. Bely, Hashima Hasan, C. R. Lynds, & Daniel Schroeder*. 369, L21, 45-C1 (1991)
- SCHUBNELL, M. S. See AKERLOF, C. W., et al. Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy.

- SCHUECKER, PETER. Scales of Structures and Homogeneity in the Universe. *Peter Schuecker & Heinz-Albert Ott.* 378, L1, 157-A1 (1991)
- SCHULTE-LADBECK, R. E. On the Wind Geometry of the Wolf-Rayet Star EZ Canis Majoris. *R. E. Schulte-Ladbeck, K. H. Nordsieck, M. Taylor, M. A. Nook, K. S. Bjorkman, A. M. Magalhães, & C. M. Anderson.* 382, 301, 204-A1 (1991)
- See TAYLOR, M., et al. First Ultraviolet Spectropolarimetry of Hot Supergiants.
- See BJORKMAN, K. S., et al. First Ultraviolet Spectropolarimetry of Be Stars from the Wisconsin Ultraviolet Photo-Polarimeter Experiment.
- SCHULTZ, A. B. The Structure of Io's Corona. *N. M. Schneider, D. M. Hunten, W. K. Wells, A. B. Schultz, & U. Fink.* 368, 298, 27-G1 (1991)
- SCHUNK, R. W. Latitudinal Dynamics of Steady Solar Wind Flows. *W.-H. Yang & R. W. Schunk.* 372, 703, 84-D5 (1991)
- SCHUTTE, W. A. 10 Micron Spectra of Protostars and the Solid Methanol Abundance. *W. A. Schutte, A. G. G. M. Tielens, & S. A. Sandford.* 382, 523, 208-A11 (1991)
- SCHWARTZ, DANIEL A. The X-Ray Cooling Flow in the Cluster of Galaxies around PKS 2354-35. *Daniel A. Schwartz, Hale V. Bradt, Ronald A. Remillard, & I. R. Tuohy.* 376, 424, 131-F6 (1991)
- SCHWARTZ, R. A. SMM/HXRBS Observations of Cygnus X-1 from 1986 December to 1988 April. *R. A. Schwartz, L. E. Orwig, B. R. Dennis, J. C. Ling, & W. A. Wheaton.* 376, 312, 128-G1 (1991)
- SCHWARTZ, RICHARD D. A Search for Embedded Young Stellar Objects in and near the IC 1396 Complex. *Richard D. Schwartz, Armen L. Gyulbudaghian, & Bruce A. Wilking.* 370, 263, 50-D9 (1991)
- SCHWARZSCHILD, MARTIN. The Ring Instability in Radially Cold Oblate Galaxy Models. *Tim de Zeeuw & Martin Schwarzschild.* 369, 57, 36-F7 (1991)
- SCIAMA, D. W. Dark Matter Decay and the Temperature of Lyman-Alpha Clouds. *D. W. Sciama.* 367, L39, 22-A11 (1991)
- SCIRTINO, S. The Diffuse Soft X-Ray Background As Seen with the Einstein Observatory. *G. Micela, F. R. Harnden, Jr., R. Rosner, S. Scirtino, & G. S. Vaiana.* 380, 495, 184-D1 (1991)
- SCODEGGIO, M. Large-Scale Peculiar Velocity Fields in Superclusters of Galaxies. *G. Gavazzi, M. Scodeggio, A. Boselli, & G. Trinchieri.* 382, 19, 200-C5 (1991)
- SCOTT, D. M. The Ultraviolet Continuum and the Fluorescent H<sub>2</sub> Lines in Low-Excitation Herbig-Haro Objects. *K.-H. Böhm, D. M. Scott, & J. Solf.* 371, 248, 63-C1 (1991)
- SCOTT, GREG. Period Changes and Evolution in RV Tauri Stars. *John R. Percy, Dimitar D. Sasselov, Amy Alfred, & Greg Scott.* 375, 691, 121-C7 (1991)
- SCOTT, TANIA R. Observation of Neutral Hydrogen in the Globular Cluster NGC 2808. *D. J. Faulkner, Tania R. Scott, P. R. Wood, & Alan E. Wright.* 374, L45, 110-C6 (1991)
- SCOVILLE, N. High-Resolution Aperture Synthesis of Molecular Gas in NGC 1068. *P. Planesas, N. Scoville, & S. T. Myers.* 369, 364, 42-C9 (1991)
- SCOVILLE, N. Z. Millimeter Interferometer Observations of Infrared Luminous Galaxies: NGC 828 and NGC 6240. *Z. Wang, N. Z. Scoville, & D. B. Sanders.* 368, 112, 24-D9 (1991)
- Molecular Gas in Luminous Infrared Galaxies. *D. B. Sanders, N. Z. Scoville, & B. T. Soifer.* 370, 158, 49-B1 (1991)
- Near-Infrared Long-Slit Spectra of NGC 1068. *M. Tamura, S. G. Kleinmann, N. Z. Scoville, & R. R. Joyce.* 371, 131, 61-F3 (1991)
- SCOVILLE, NICHOLAS Z. Near-Infrared Emission-Line Images of Three Herbig-Haro Objects. *Karl R. Stapelfeldt, Charles A. Beichman, J. Jeff Hester, Nicholas Z. Scoville, & Thomas N. Gautier III.* 371, 226, 63-A1 (1991)
- SCOVILLE, NICK. OB Star Formation and H I Production in Molecular Clouds in M33. *Christine D. Wilson & Nick Scoville.* 370, 184, 49-D11 (1991)
- The Molecular Gas Content of the Nuclear Region of M33: Erratum. *Christine D. Wilson & Nick Scoville.* 372, 349, 78-C7 (1991) (Original paper in 347, 743, 192-E7 (1989))
- SCOVILLE, NICK Z. The Star-forming Disk and CO Bar in M101. *Jeffrey D. Penney, Nick Z. Scoville, & Christine D. Wilson.* 366, 432, 8-C1 (1991)
- SCOWEN, P. A. Observation of a Pulsar Wind: CCD Polarimetry of the Crab Nebula. *F. C. Michel, P. A. Scowen, R. J. Dufour, & J. J. Hester.* 368, 463, 30-G1 (1991)
- SEAB, C. G. Diffuse Band Profiles in the Spectrum of HD 29647: Evidence for a Molecular Origin? *Theodore P. Snow & C. G. Seab.* 382, 189, 202-E7 (1991)
- SEAQUIST, E. R. AG Pegasus: A Multishell Radio Source. *H. T. Kenny, A. R. Taylor, & E. R. Seaquist.* 366, 549, 9-G7 (1991)
- OH Emission and the Nature of Minkowski's Footprint (M1-92). *E. R. Seaquist, René Plume, & L. E. Davis.* 367, 200, 14-E5 (1991)
- A Nonthermal Radio Halo Surrounding M82. *E. R. Seaquist & Nils Odegard.* 369, 320, 41-F13 (1991)
- The Neutral Hydrogen Distribution of NGC 3079. *Judith A. Irwin & E. R. Seaquist.* 371, 111, 61-D9 (1991)
- SEARLE, LEONARD. Globular Cluster Mass Functions. *Harvey B. Richer, Gregory G. Fahman, Roberto Buonanno, Flavio Fusi Pecci, Leonard Searle, & Ian B. Thompson.* 381, 147, 190-G7 (1991)
- SECKEL, D. Signatures of Cosmic-Ray Interactions on the Solar Surface. *D. Seckel, Todor Stanev, & T. K. Gaisser.* 382, 652, 209-F8 (1991)
- SEETHA, S. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- SEIDELMANN, P. KENNETH. See LYNDS, ROGER, et al. NGC 1068: Resolution of Nuclear Structure in the Optical Continuum.
- See HOLTZMAN, JON A., et al. Stellar Photometry with the *Hubble Space Telescope* Wide-Field/Planetary Camera: A Progress Report.
- See WESTPHAL, JAMES A., et al. *Hubble Space Telescope* Wide-Field/Planetary Camera Images of Saturn.
- SEKIGUCHI, M. Infrared Polarization Images of Star-forming Regions. I. The Ubiquity of Bipolar Structure. *M. Tamura, Ian Gatley, R. R. Joyce, M. Ueno, H. Suto, & M. Sekiguchi.* 378, 611, 160-A1 (1991)
- SELLGREN, K. The Interstellar C-H Stretching Band near 3.4 Microns: Constraints on the Composition of Organic Material in the Diffuse Interstellar Medium. *S. A. Sandford, L. J. Allamandola, A. G. G. M. Tielens, K. Sellgren, M. Tapia, & Y. Pendleton.* 371, 607, 69-B1 (1991)
- High-Resolution Spectra of the 3.29 Micron Interstellar Emission Feature: A Summary. *A. T. Tokunaga, K. Sellgren, R. G. Smith, T. Nagata, A. Sakata, & Y. Nakada.* 380, 452, 183-G8 (1991)
- SEMBACH, KENNETH R. Ultraviolet Interstellar Absorption toward HD 156359, a Halo Star at 11 Kiloparsecs in the Direction  $l = 329^\circ$  and  $b = -15^\circ$ . *Kenneth R. Sembach, Blair D. Savage, & Derck Massa.* 372, 81, 75-A11 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Element Abundances as a Function of Velocity in the Neutral Gas toward  $\xi$  Persei. *Blair D. Savage, Jason A. Cardelli, Frederick C. Bruhweiler, Andrew M. Smith, Dennis C. Ebbets, & Kenneth R. Sembach.* 377, L53, 143-F6 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Elemental Abundances in the Diffuse Clouds toward  $\xi$  Persei. *Jason A. Cardelli, Blair D. Savage, Frederick C. Bruhweiler, Andrew M. Smith, Dennis C. Ebbets, Kenneth R. Sembach, & Ulysses J. Sofia.* 377, L57, 143-F11 (1991)
- The Analysis of Apparent Optical Depth Profiles for Interstellar Absorption Lines. *Blair D. Savage & Kenneth R. Sembach.* 379, 245, 166-B5 (1991)
- SENECHA, V. K. Possible Detection of TeV Gamma Rays from AM Herculis. *C. L. Bhat, R. K. Kaul, H. S. Rawat, V. K. Senecha, R. C. Rannat, M. L. Sapru, A. K. Tickoo, & H. Razdan.* 369, 475, 43-E12 (1991)
- SEO, E. S. Measurement of Cosmic-Ray Proton and Helium Spectra during the 1987 Solar Minimum. *E. S. Seo, J. F. Ormes, R. E. Streitmatter, S. J. Stochaj, W. V. Jones, S. A. Stephens, & T. Bowen.* 378, 763, 161-G1 (1991)
- SERABYN, E. A Gaseous Tail Ablated from the Supergiant IRS 7 near the Galactic Center. *E. Serabyn, J. H. Lacy, & J. M. Achtermann.* 378, 557, 159-C9 (1991)

- Galactic Center Gasdynamics: A One-armed Spiral in a Keplerian Disk.** *J. H. Lacy, J. M. Achermann, & E. Serabyn.* 380, L71, 188-D6 (1991)
- SEWARD, F. D.** The *Einstein Objective Grating Spectrometer Survey of Galactic Binary X-Ray Sources.* *S. D. Vrilek, J. E. McClintock, F. D. Seward, S. M. Kahn, & B. J. Wargelin.* 76, 1127, 41-C1 (1991)
- SHAFER, R. A.** See **SMOOT, G. F.**, et al. Preliminary Results from the *COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.*
- See **WRIGHT, E. L.**, et al. Preliminary Spectral Observations of the Galaxy with a 7° Beam by the *Cosmic Background Explorer (COBE).*
- SHAFFER, DAVID B.** Multifrequency VLA, VLBI, and Single-Dish Observations of the Quasar 4C 39.25. *Alan P. Marscher, Yun Fei Zhang, David B. Shaffer, Hugh D. Aller, & Margo F. Aller.* 371, 491, 67-E12 (1991)
- SHAFTER, ALLEN W.** The Pulse-timing and Emission-Line Orbits of the White Dwarf in the Cataclysmic Variable AE Aquarii. *Edward L. Robinson, Allen W. Shafter, & S. Balachandran.* 374, 298, 101-G1 (1991)
- SHAHAM, JACOB.** On the Nature and Evolution of the Windy Binary Pulsar PSR 1744-24A. *Jacob Shaham & Marco Tavani.* 377, 588, 147-A11 (1991)
- SHAN, JUN.** 3.3 Micron Emission from Ultraviolet Excitation of Some Aromatic Molecules. *Jun Shan, Masako Suto, & L. C. Lee.* 383, 459, 218-A7 (1991)
- SHAN, LIN-HUA.** On the Radial Structure of Saturn's B Ring. *Lin-Hua Shan & C. K. Goertz.* 367, 350, 16-D1 (1991)
- SHANBHAG, SMITA.** Effect of a QSO on the Interstellar Medium of Its Host Galaxy. *Smita Shanbhag.* 367, 462, 19-B5 (1991)
- SHANDARIN, SERGEI F.** Gravitational Clustering in the Expanding Universe: Controlled High-Resolution Studies in Two Dimensions. *John Francis Beacom, Kurt G. Dominik, Adrian L. Melott, Sam P. Perkins, & Sergei F. Shandarin.* 372, 351, 80-B7 (1991)
- A Quantitative Measure of Phase Correlations in Density Fields. *Robert J. Scherrer, Adrian L. Melott, & Sergei F. Shandarin.* 377, 29, 138-D5 (1991)
- SHANKAR, ANURAG.** The Common Envelope Phase in Classical Novae: One-dimensional Models. *Anurag Shankar, Mario Livio, & James W. Truran.* 374, 623, 106-G6 (1991)
- SN 1991T: Gamma-Ray Observatory's First Supernova? *Adam Burrows, Anurag Shankar, & Kenneth A. Van Riper.* 379, L7, 169-B1 (1991)
- SHAPIRO, I. I.** New Model for the 0957+561 Gravitational Lens System: Bounds on Masses of a Possible Black Hole and Dark Matter and Prospects for Estimation of  $H_0$ . *E. E. Falco, M. V. Gorenstein, & I. I. Shapiro.* 372, 364, 80-D1 (1991)
- SHAPIRO, STUART L.** Explosion of a Rotating Neutron Star near the Minimum Mass. *Monica Colpi, Stuart L. Shapiro, & Saul A. Teukolsky.* 369, 422, 43-A5 (1991)
- Equation of State in a Strong Magnetic Field: Finite Temperature and Gradient Corrections. *Andrew M. Abrahams & Stuart L. Shapiro.* 374, 652, 107-B12 (1991)
- Collisions of Giant Stars with Compact Objects: Hydrodynamical Calculations. *Frederic A. Rasio & Stuart L. Shapiro.* 377, 559, 146-F1 (1991)
- Equation of State in Metals and Cold Stars: Evaluation of Statistical Models. *Dong Lai, Andrew M. Abrahams, & Stuart L. Shapiro.* 377, 612, 147-C10 (1991)
- Molecules and Chains in a Strong Magnetic Field: Statistical Treatment. *Andrew M. Abrahams & Stuart L. Shapiro.* 382, 233, 203-B5 (1991)
- Cold Equation of State in a Strong Magnetic Field: Effects of Inverse  $\beta$ -Decay. *Dong Lai & Stuart L. Shapiro.* 383, 745, 223-D11 (1991)
- SHAPOVALOVA, A. I.** See **PETERSON, B. M.**, et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- SHARE, GERALD H.** A Search for the 478 keV Line from the Decay of Nucleosynthetic  $^7\text{Be}$ . *Michael J. Harris, Mark D. Leising, & Gerald H. Share.* 375, 216, 113-F5 (1991)
- A Search for the 2.223 MeV Neutron Capture Gamma-Ray Line from the Directions of Cygnus and the Galactic Center. *Michael J. Harris & Gerald H. Share.* 381, 439, 196-B10 (1991)
- SHAVIV, GIORA.** The Formation of  $^{26}\text{Al}$  Nova Explosions. *Irit Nofar, Giora Shaviv, & Sumner Starrfield.* 369, 440, 43-B11 (1991)
- SHAYA, EDWARD J.** See **LYNDS, ROGER**, et al. NGC 1068: Resolution of Nuclear Structure in the Optical Continuum.
- See **HOLTZMAN, JON A.**, et al. Stellar Photometry with the *Hubble Space Telescope* Wide-Field/Planetary Camera: A Progress Report.
- See **LAUER, TOD R.**, et al. The Core of the Nearby S0 Galaxy NGC 7457 Imaged with the *HST* Planetary Camera.
- See **LAUER, TOD R.**, et al. The Postcollapse Core of M15 Imaged with the *HST* Planetary Camera.
- See **WESTPHAL, JAMES A.**, et al. *Hubble Space Telescope* Wide-Field/Planetary Camera Images of Saturn.
- See **HESTER, J. JEFF**, et al. Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0''.1.
- SHECTMAN, STEPHEN A.** Detection of a Galactic Color Gradient for Blue Horizontal-Branch Stars of the Halo Field and Implications for the Halo Age and Density Distributions. *George W. Preston, Stephen A. Shectman, & Timothy C. Beers.* 375, 121, 112-E1 (1991)
- Photoelectric *UBV* Photometry of Stars Selected in the HK Objective-Prism Survey. *George W. Preston, Stephen A. Shectman, & Timothy C. Beers.* 76, 1001, 38-G5 (1991)
- SHEELEY, N. R., JR.** Why Fast Solar Wind Originates from Slowly Expanding Coronal Flux Tubes. *Y.-M. Wang & N. R. Sheeley, Jr.* 372, L45, 79-F1 (1991)
- Polar Faculae: 1906-1990. *N. R. Sheeley, Jr.* 374, 386, 102-G11 (1991)
- Magnetic Flux Transport and the Sun's Dipole Moment: New Twists to the Babcock-Leighton Model. *Y.-M. Wang & N. R. Sheeley, Jr.* 375, 761, 122-B5 (1991)
- A New Solar Cycle Model Including Meridional Circulation. *Y.-M. Wang, N. R. Sheeley, Jr., & A. G. Nash.* 383, 431, 217-F1 (1991)
- SHEFFER, YARON.** First Results from the Goddard High-Resolution Spectrograph: C I, S I, and CO toward  $\xi$  Persei and the Physical Conditions in Diffuse Clouds. *Andrew M. Smith, Frederick C. Bruhweiler, David L. Lambert, Blair D. Savage, Jason A. Cardelli, Dennis C. Ebbets, Cheng-Hsuan Lyu, & Yaron Sheffer.* 377, L61, 143-G1 (1991)
- SHELLEY, E. G.** Observations of Solar Wind Ion Charge Exchange in the Comet Halley Coma. *S. A. Fuselier, E. G. Shelley, B. E. Goldstein, R. Goldstein, M. Neugebauer, W.-H. Ip, H. Balsiger, & H. Rème.* 379, 734, 173-G8 (1991)
- SHELUS, P. J.** See **FRANZ, O. G.**, et al. Binary Star Observations with the *Hubble Space Telescope* Fine Guidance Sensors. I. ADS 11300.
- SHEMANSKY, D. E.** Collisional Excitation and Radiative Properties of N II: The Strong Intercombination ( $^1\text{D} - ^3\text{P}^0$ ) Transition at 748 Å. *T. M. Tripp, D. E. Shemansky, G. K. James, & J. M. Ajello.* 368, 641, 33-B6 (1991)
- Cross Sections for Production of H(2p, 2s, 1s) by Electron Collisional Dissociation of H<sub>2</sub>. *J. M. Ajello, D. E. Shemansky, & G. K. James.* 371, 422, 65-D5 (1991)
- SHEMI, AMOTZ.** Neutron Star and Black Hole Binaries in the Galaxy. *Ramesh Narayan, Tsvi Piran, & Amotz Shemi.* 379, L17, 169-B11 (1991)
- SHETRONE, MATHEW D.** V795 Herculis (=PG 1711+336), A Peculiar Intermediate Polar without Strong X-Ray Emission. *Erho Zhang, Edward L. Robinson, Tod F. Ramseyer, Mathew D. Shetrone, & Rae F. Stiening.* 381, 534, 197-C10 (1991)
- SHIBAI, HIROSHI.** Large-Scale [C II] 158 Micron Emission from the Galaxy. *Hiroshi Shibai, Haruyuki Okuda, Takao Nakagawa, Hideo Matsuhara, Toshinori Maihara, Kohji Mizutani, Yukiyasu Kobayashi, Norihisa Hiromoto, Tetsuo Nishimura, & Frank J. Low.* 374, 522, 105-F1 (1991)
- SHIBATA, KAZUNARI.** Numerical Simulations of Microflare Evolution in the Solar Transition Region and Corona. *Alphonse C. Sterling, John T. Mariska, Kazunari Shibata, & Yoshinori Suematsu.* 381, 313, 192-G8 (1991)
- SHIBATA, S.** See **MURAKI, Y.**, et al. Observations of Ultra-High-Energy Photons from Cygnus X-3.

- SHIBATA, SHINPEI. Magnetosphere of the Rotation-powered Pulsar: A DC Circuit Model. *Shinpei Shibata*. 378, 239, 154-A1 (1991)
- SHIELDS, GREGORY A. High Chemical Abundances in Virgo Spiral Galaxies? *Gregory A. Shields, Evan D. Skillman, & Robert C. Kennicutt, Jr.* 371, 82, 61-B1 (1991)
- SHIELDS, J. C. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- SHIELDS, JOSEPH C. Premaximum Observations of the Type Ia SN 1990N. *Bruno Leibundgut, Robert P. Kirshner, Alexei V. Filippenko, Joseph C. Shields, Craig B. Politz, Mark M. Phillips, & George Sonneborn*. 371, L23, 66-D1 (1991)
- SHIGEYAMA, TOSHIKAZU. Rayleigh-Taylor Instabilities and Mixing in the Helium Star Models for Type Ib/Ic Supernovae. *Izumi Hachisu, Takuya Matsuda, Ken'ichi Nomoto, & Toshikazu Shigeyama*. 368, L27, 35-B4 (1991)
- SHIPMAN, H. L. Inefficient Accretion by the DA2 White Dwarf in V471 Tauri. *D. J. Mullan, H. L. Shipman, E. M. Sion, & J. MacDonald*. 374, 707, 107-G8 (1991)
- SHIPMAN, HARRY L. A Critical Analysis of the Ultraviolet Temperature Scale of the Helium-dominated DB and DBV White Dwarfs. *Peter Thejll, Stéphane Vennes, & Harry L. Shipman*. 370, 355, 51-F5 (1991)
- The Binary Feige 24: The Mass, Radius, and Gravitational Redshift of the DA White Dwarf. *Stéphane Vennes, John R. Thorstensen, Peter Thejll, & Harry L. Shipman*. 372, L37, 79-E5 (1991)
- SHITOV, YURI P. Microstructure-determined Pulsar Dispersion Measures and the Problem of Profile Alignment. *Timothy H. Hankins, Vera A. Izvekova, Valerii M. Malofeev, Joanna M. Rankin, Yuri P. Shitov, & Daniel R. Stinebring*. 373, L17, 91-C1 (1991)
- SHORE, STEVEN N. Multiwavelength Observations of Nova LMC 1990 Number 2: The First Extragalactic Recurrent Nova. *Steven N. Shore, George Sonneborn, Sumner G. Starrfield, M. Hamuy, R. E. Williams, A. Cassatella, & H. Drechsel*. 370, 193, 49-E8 (1991)
- First Results from the Goddard High-Resolution Spectrograph: A Demonstration of Spectral Resolution and Experiments with Deconvolution. *Glen M. Wahlgren, David S. Leckrone, Steven N. Shore, Don J. Lindler, Ronald L. Gilliland, & Dennis C. Ebbets*. 377, L41, 143-E6 (1991)
- SHRADER, CHRIS R. The Ultraviolet Spectrum and Continuum Energy Distribution of the Bright Quasar H1821+643. *Michiel Kolman, Jules P. Halpern, Chris R. Shrader, & Alexei V. Filippenko*. 373, 57, 86-F8 (1991)
- SHU, FRANK H. Star Formation and the Nature of Bipolar Outflows. *Frank H. Shu, Steven P. Ruden, Charles J. Lada, & Susana Lizano*. 370, L31, 53-E1 (1991)
- SHULL, J. MICHAEL. Simulations of the Supernova-dominated Interstellar Medium in Disk Galaxies. *Denis F. Cioffi & J. Michael Shull*. 367, 96, 13-B13 (1991)
- New Observations of the Gas Cloud Associated with the Quasar-Galaxy Pair 3C 232/NGC 3067. *John T. Stocke, James Case, Megan Donahue, J. Michael Shull, & Theodore P. Snow*. 374, 72, 98-G7 (1991)
- New Photoionization Models of Intergalactic Clouds. *Megan Donahue & J. Michael Shull*. 383, 511, 220-F1 (1991)
- SHULL, PETER, JR. A Kinematic and Proper-Motion Survey of the Cygnus Loop. *Peter Shull, Jr., & Hans Hippelien*. 383, 714, 223-B3 (1991)
- SIKORA, MAREK. Consequences of Relativistic Proton Injection in Active Galactic Nuclei: Erratum. *Mitchell C. Begelman, Bronislaw Rudak, & Marek Sikora*. 370, 791, 58-D1 (1991) (Orig. paper in 362, 38, 169-E3 (1990))
- Outflows Driven by Cosmic-Ray Pressure in Broad Absorption Line QSOs. *Mitchell C. Begelman, Marijn de Kool, & Marek Sikora*. 382, 416, 206-F9 (1991)
- SILBER, A. Ginga Observation of an AM Herculis Type Source H0538+608. *M. Ishida, A. Silber, H. V. Bradt, R. A. Remillard, K. Makishima, & T. Ohashi*. 367, 270, 15-D6 (1991)
- The Eclipsing AM Herculis Variable H1907+690. *R. A. Remillard, B. A. Siroozas, S. Tapia, & A. Silber*. 379, 715, 173-E13 (1991)
- SITKO, JOSEPH. Limits on Cold Dark Matter Cosmologies from New Anisotropy Bounds on the Cosmic Microwave Background. *Nicola Vittorio, Peter Meinhold, Pio Francesco Muciaccia, Philip Lubin, & Joseph Silk*. 372, L1, 79-A7 (1991)
- Tidally Triggered Galaxy Formation. I. Evolution of the Galaxy Luminosity Function. *Cedric Lacey & Joseph Silk*. 381, 14, 189-C1 (1991)
- SILVERBERG, R. F. See SMOOT, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a 7° Beam by the Cosmic Background Explorer (COBE).
- SIMON, G. W. Modeling Mesogranules and Exploders on the Solar Surface. *G. W. Simon, A. M. Title, & N. O. Weiss*. 375, 775, 122-C7 (1991)
- SIMON, NORMAN R. The RRd Masses Revisited. *Norman R. Simon & Arthur N. Cox*. 376, 717, 135-C1 (1991)
- SIMON, THEODORE. Stellar Lyman-Alpha Emission and the Local Interstellar Medium. *Wayne Landsman & Theodore Simon*. 366, L79, 11-D9 (1991)
- The Onset of Chromospheric Activity among the A and F Stars. *Theodore Simon & Wayne Landsman*. 380, 200, 178-E3 (1991)
- SIMONNEAU, E. The Use of Iteration Factors for Temperature Correction in a Stellar Atmosphere When Convective Transport Is Present. *L. Crivellari & E. Simonneau*. 367, 612, 20-G10 (1991)
- SIMONS, D. A. Infrared Emission Regions in the Interacting Galaxy System Arp 299. *C. G. Wynn-Williams, S. A. Eales, E. E. Becklin, K.-W. Hodapp, R. D. Joseph, I. S. McLean, D. A. Simons, & G. S. Wright*. 377, 426, 145-A13 (1991)
- SIMPSON, J. P. Far-Infrared Line and Continuum Observations of G0.095+0.012 and the E2 Thermal Radio Filament near the Galactic Center. *Edwin F. Erickson, Sean W. J. Colgan, J. P. Simpson, Robert H. Rubin, Mark Morris, & Michael R. Haas*. 370, L69, 59-C1 (1991)
- Axisymmetric Model of the Ionized Gas in the Orion Nebula. *R. H. Rubin, J. P. Simpson, M. R. Haas, & E. F. Erickson*. 374, 564, 106-B12 (1991)
- SIMPSON, JANET P. IRAS Low-Resolution Spectral Observations of the 10 and 18 Micron Silicate Emission Features. *Janet P. Simpson*. 368, 570, 32-B13 (1991)
- SINCLAIR, D. See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- SINGH, JYOTI. Spin-up of the White Dwarf in the Intermediate Polar 3A 0729+103. *Jyoti Singh, P. C. Agrawal, K. M. V. Apparao, P. Vivekanand Rao, & M. B. K. Sarma*. 380, 208, 178-E11 (1991)
- SINGH, K. P. EXOSAT Observations of the X-Ray Source 2S 0114+65. *Krishna M. V. Apparao, P. Bishnu, & K. P. Singh*. 371, 772, 71-B6 (1991)
- X-Ray Luminosity and Spectral Variability in the Seyfert Type I Galaxy PG 2130+099. *K. P. Singh, A. R. Rao, & M. N. Vahia*. 372, 49, 74-E13 (1991)
- The Formation and Detection of Strongly Magnetic White Dwarf Binaries in Globular Clusters. *G. Chanmugam, A. Ray, & K. P. Singh*. 375, 600, 120-B9 (1991)
- X-Ray Observations of the Bright Seyfert Galaxy IC 4329A. *K. P. Singh, A. R. Rao, & M. N. Vahia*. 377, 417, 145-A1 (1991)
- SINGH, R. K. Ionization States of the Anomalous Cosmic Rays. *R. K. Singh, Banashree Mitra, N. Durgaprasad, S. Biswas, M. N. Vahia, J. S. Yadav, A. Dutta, & J. N. Goswami*. 374, 753, 108-D7 (1991)
- SINNIS, C. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- SION, E. M. Inefficient Accretion by the DA2 White Dwarf in V471 Tauri. *D. J. Mullan, H. L. Shipman, E. M. Sion, & J. MacDonald*. 374, 707, 107-G8 (1991)
- SION, EDWARD M. A Study of the Ultraviolet Evolution of U Geminorum between Outbursts. *Alan L. Kiplinger, Edward M. Sion, & Paula Szkody*. 366, 569, 10-B1 (1991)
- SIRONI, G. The Brightness Temperature of the South Celestial Pole and the Temperature of the Cosmic Background Radiation Measured at 36.6 and 12 Centimeter Wavelength. *G. Sironi, G. Bonelli, & M. Limon*. 378, 550, 159-C1 (1991)
- SITKO, MICHAEL L. Infrared Polarimetry of Quasars. *Michael L. Sitko & Yudong Zhu*. 369, 106, 37-C5 (1991)

- Optical Polarimetry of PKS 2155-304 and Constraints on Accretion Disk Models for BL Lacertae Objects. *Paul S. Smith & Michael L. Sitko.* 383, 580, 221-D9 (1991)
- SKILLMAN, EVAN D. High Chemical Abundances in Virgo Spiral Galaxies? *Gregory A. Shields, Evan D. Skillman, & Robert C. Kennicutt, Jr.* 371, 82, 61-B1 (1991)
- He II Emission in Extragalactic H II Regions. *Donald R. Garnett, Robert C. Kennicutt, Jr., You-Hua Chu, & Evan D. Skillman.* 373, 458, 93-E14 (1991)
- SKINNER, G. K. The Distribution of Dark Matter in the Perseus Cluster. *C. J. Eyles, M. P. Watt, D. Bertram, M. J. Church, T. J. Ponman, G. K. Skinner, & A. P. Willmore.* 376, 23, 125-C12 (1991)
- SKINNER, STEPHEN L. Nonthermal Radio Emission from the X-Ray-Bright K5 IV Star 1E 1751+7046. *Stephen L. Skinner.* 368, 272, 26-D11 (1991)
- SKUMANICH, ANDREW. Evidence for External Plasma around the K Dwarf Component of the Eclipsing Binary V471 Tauri. *Arthur Young, Lee Rotter, & Andrew Skumanich.* 378, L25, 157-D1 (1991)
- SLANINA, Z. The Formation and Role of Water Dimers in a Cometary Atmosphere, with Application to Comet P/Halley. *J. F. Crifo & Z. Slanina.* 383, 351, 216-F1 (1991)
- SLETTEBAK, ARNE. Physical Conditions in the Orion Nebula and an Assessment of Its Helium Abundance. *Jack A. Baldwin, Gary J. Ferland, P. G. Martin, Michael R. Corbin, Stephen A. Cota, Bradley M. Peterson, & Arne Slettebak.* 374, 580, 106-D1 (1991)
- SLIPHER, V. M. Gas and Dust Production by Comet P/Halley (1910 II). *Ellen S. Howell, Barry L. Lutz, & V. M. Slipher.* 371, 776, 71-B11 (1991)
- SMALE, ALAN P. A Study of the H $\alpha$  Line in X1735-444. *Alan P. Smale & Robin H. D. Corbet.* 383, 853, 224-G6 (1991)
- SMALL, TODD A. A New Approach to Gravitational Microlensing: Time Delays and the Galactic Mass Distribution. *Lawrence M. Krauss & Todd A. Small.* 378, 22, 151-C8 (1991)
- SMECKER, TAMMY A. Type Ia Supernovae: Constraints on Baryonic Dark Matter. *Tammy A. Smecker & Rosemary F. G. Wyse.* 372, 448, 81-D1 (1991)
- SMITH, A. G. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- SMITH, ANDREW M. See BOHLIN, RALPH C., et al. Simulated Optical Images of Galaxies at  $z \sim 1$  Using Ultraviolet Images of Nearby Galaxies.
- First Results from the Goddard High-Resolution Spectrograph: Element Abundances as a Function of Velocity in the Neutral Gas toward  $\xi$  Persei. *Blair D. Savage, Jason A. Cardelli, Frederick C. Bruhweiler, Andrew M. Smith, Dennis C. Ebbets, & Kenneth R. Sembach.* 377, L53, 143-F6 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Elemental Abundances in the Diffuse Clouds toward  $\xi$  Persei. *Jason A. Cardelli, Blair D. Savage, Frederick C. Bruhweiler, Andrew M. Smith, Dennis C. Ebbets, Kenneth R. Sembach, & Ulysses J. Sofia.* 377, L57, 143-F11 (1991)
- First Results from the Goddard High-Resolution Spectrograph: C I, S I, and CO toward  $\xi$  Persei and the Physical Conditions in Diffuse Clouds. *Andrew M. Smith, Frederick C. Bruhweiler, David L. Lambert, Blair D. Savage, Jason A. Cardelli, Dennis C. Ebbets, Cheng-Hsuan Lyu, & Yaron Sheffer.* 377, L61, 143-G1 (1991)
- SMITH, BEVERLY J. The Far-Infrared Morphology of the Double-ringed Galaxy NGC 4736 (M94): A Ring Surrounding an Extended Nucleus. *Beverly J. Smith, D. F. Lester, P. M. Harvey, & R. W. Pogge.* 373, 66, 86-G5 (1991)
- The Discovery of a Long H I Plume near the Peculiar Galaxy NGC 2782 (Arp 215). *Beverly J. Smith.* 378, 39, 151-E1 (1991)
- The Far-Infrared Morphology of the Double-ringed Spiral Galaxy NGC 4736 (M94): A Ring Surrounding an Extended Nucleus: Erratum. *Beverly J. Smith, D. F. Lester, P. M. Harvey, & R. W. Pogge.* 380, 677, 186-E6 (1991) (Orig. paper in 373, 66, 86-G5 (1991))
- SMITH, BRADFORD A. See WESTPHAL, JAMES A., et al. *Hubble Space Telescope Wide-Field/Planetary Camera Images of Saturn.*
- SMITH, CHARLES W. Solar Cycle Variation of the Interplanetary Magnetic Field Spiral. *Charles W. Smith & John W. Bieber.* 370, 435, 52-F4 (1991)
- SMITH, CRAIG H. Polarimetric Imaging of the Galactic Center at 12.4 Microns: The Detailed Magnetic Field Structure in the Northern Arm and East-West Bar. *David K. Aitken, Daniel Gezari, Craig H. Smith, Mark McCaughrean, & Patrick F. Roche.* 380, 419, 183-D10 (1991)
- SMITH, D. F. Coronal Proton Transport in the Presence of Alfvén Waves and Implications for Gamma-Ray Burst Models. *D. F. Smith & S. H. Brecht.* 373, 289, 89-E9 (1991)
- SMITH, GRAEME H. Interaction of Mass Lost in Globular Clusters with the Halo Medium. *D. J. Faulkner & Graeme H. Smith.* 380, 441, 183-F7 (1991)
- SMITH, H. A. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- SMITH, HAYWOOD, JR. On the Sensitivity of the N-Body Problem to Small Changes in Initial Conditions. *Henry E. Kandrup & Haywood Smith, Jr.* 374, 255, 101-C9 (1991)
- SMITH, HOWARD A. Infrared Recombination Lines of Hydrogen from Young Objects in the Southern Galactic Plane. *Sara C. Beck, Jacqueline Fischer, & Howard A. Smith.* 383, 336, 216-D1 (1991)
- SMITH, I. A. See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- SMITH, J. D. See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- SMITH, KERMIT L. Multi-Wave Band SMM-VLA Observations of an M2 Flare and an Associated Coronal Mass Ejection. *Robert F. Willson, Joan T. Schmelz, Raymond D. Gonzalez, Kenneth R. Lang, & Kermit L. Smith.* 378, 360, 155-D6 (1991)
- SMITH, LESLEY L. Hollow Galactic Halos of Fermionic Dark Matter. *John P.Ralston & Lesley L. Smith.* 367, 54, 12-F4 (1991)
- SMITH, M. G. See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- SMITH, MYRON A. Circumstellar Material around  $\lambda$  Eridani (B2e). I. Geometry and Kinematics during 1987-1988. *Myron A. Smith, Geraldine J. Peters, & C. A. Grady.* 367, 302, 15-G1 (1991)
- SMITH, P. S. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- SMITH, PAUL S. *UBVRI* Photometry of Stars in the Fields of X-Ray Selected BL Lacertae Objects. *Paul S. Smith, Buell T. Jannuzzi, & Richard Elston.* 77, 67, 44-D1 (1991)
- Optical Polarimetry of PKS 2155-304 and Constraints on Accretion Disk Models for BL Lacertae Objects. *Paul S. Smith & Michael L. Sitko.* 383, 580, 221-D9 (1991)
- SMITH, PETER L. High-Resolution Absorption Cross Sections of Carbon Monoxide Bands at 295 K between 91.7 and 100.4 Nanometers. *G. Stark, K. Yoshino, Peter L. Smith, K. Ito, & W. H. Parkinson.* 369, 574, 44-G13 (1991)
- SMITH, R. CHRIS. Spectra of Two Very Old Supernovae: SN 1986J and SN 1980K. *Bruno Leibundgut, Robert P. Kirshner, Philip A. Pinto, Michael P. Rupen, R. Chris Smith, James E. Gunn, & Donald P. Schneider.* 372, 531, 82-D1 (1991)
- Six Balmer-dominated Supernova Remnants. *R. Chris Smith, Robert P. Kirshner, William P. Blair, & P. Frank Winkler.* 375, 652, 120-G1 (1991)
- SMITH, R. G. High-Resolution Spectra of the 3.29 Micron Interstellar Emission Feature: A Summary. *A. T. Tokunaga, K. Sellgren, R. G. Smith, T. Nagata, A. Sakata, & Y. Nakada.* 380, 452, 183-G8 (1991)
- SMITH, TOBY. A COSMOS Study of the Structure and Content of NGC 6822. *Paul Hodge, Toby Smith, Paul Eskridge, Harvey MacGillivray, & Steven Beard.* 379, 621, 172-D1 (1991)
- SMITH, TOBY R. A Cosmos Study of IC 1613. *Paul W. Hodge, Toby R. Smith, Paul B. Eskridge, Harvey T. MacGillivray, & Steven M. Beard.* 369, 372, 42-D5 (1991)
- SMITH, V. V. Interstellar Environments Probed by Ca I Absorption and the Effects of Density-dependent Depletions. *Jason A. Cardelli, S. R. Federman, & V. V. Smith.* 381, L17, 194-C7 (1991)

- SMITH, VERNE V.** Carbon Isotopic Abundances in Giant Stars in the CN-bimodal Globular Clusters NGC 6752 and M4. *Nicholas B. Sunzieve & Verne V. Smith*. 381, 160, 191-A8 (1991)
- SMOOT, G. F.** Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background. *G. F. Smoot, C. L. Bennett, A. Kogut, J. Aymon, C. Backus, G. De Amici, K. Galuk, P. D. Jackson, P. Keegstra, L. Rokke, L. Tenorio, S. Torres, S. Gulkis, M. G. Hauser, M. A. Janssen, J. C. Mather, R. Weiss, D. T. Wilkinson, E. L. Wright, N. W. Boggess, E. S. Cheng, T. Kelsall, P. Lubin, S. Meyer, S. H. Moseley, T. L. Murdoch, R. A. Shafer, & R. F. Silverberg*. 371, L1, 66-A7 (1991)
- See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a 7° Beam by the *Cosmic Background Explorer (COBE)*.
- SMOOT, GEORGE F.** The Temperature of the Cosmic Microwave Background Radiation at 3.8 GHz: Results of a Measurement from the South Pole Site. *Giovanni De Amici, Marco Bersanelli, Al Kogut, Steve Levin, Michele Limon, & George F. Smoot*. 381, 341, 193-C1 (1991)
- SNELL, R. L.** Probing the Core of Cepheus A: Millimeter and Submillimeter Observations. *G. H. Moriarty-Schieven, R. L. Snell, & V. A. Hughes*. 374, 169, 100-B3 (1991)
- SNELL, RONALD L.** Molecular Outflows Associated with Young Stellar Objects in the L1641 Region of Orion. *James A. Morgan, F. Peter Schloerb, Ronald L. Snell, & John Bally*. 376, 618, 134-A12 (1991)
- Star Counts and Carbon Monoxide Observations of Maddalena's Cloud. *Youngung Lee, Ronald L. Snell, & Robert L. Dickman*. 379, 639, 172-E11 (1991)
- SNEYD, A. D.** Nonlinear Development of the Kink Instability in Coronal Flux Tubes: Erratum. *I. J. D. Craig & A. D. Sneyd*. 371, 443, 65-F3 (1991) (Orig. paper in 357, 653, 120-F5 (1990))
- SNIJDERS, M. A. J.** The Ultraviolet Spectrum of NGC 4151 from 1978 to 1990: General Characteristics and Evolution. *M.-H. Ulrich, A. Bokkenberg, G. E. Bromage, J. Clavel, A. Elvius, M. V. Penston, G. C. Perola, & M. A. J. Snijders*. 382, 483, 207-E7 (1991)
- SNODGRASS, HERSCHEL B.** A Torsional Oscillation in the Rotation of the Solar Magnetic Field. *Herschel B. Snodgrass*. 383, L85, 226-F10 (1991)
- SNOW, THEODORE P.** The Mid-Infrared Spectrum of the Carbon Star HD 38218 and Its Possible Relation to Polycyclic Aromatic Hydrocarbons. *Richard H. Buss, Jr., A. G. G. M. Tielens, & Theodore P. Snow*. 372, 281, 77-D8 (1991)
- New Observations of the Gas Cloud Associated with the Quasar-Galaxy Pair 3C 232/NGC 3067. *John T. Stocke, James Case, Megan Donahue, J. Michael Shull, & Theodore P. Snow*. 374, 72, 98-G7 (1991)
- Diffuse Band Profiles in the Spectrum of HD 29647: Evidence for a Molecular Origin? *Theodore P. Snow & C. G. Seab*. 382, 189, 202-E7 (1991)
- SNOWDEN, S. L.** Limits on the Density of Neutral Gas within 100 Parsecs from Observations of the Soft X-Ray Background. *M. Juda, J. J. Bloch, B. C. Edwards, D. McCammon, W. T. Sanders, S. L. Snowden, & J. Zhang*. 367, 182, 14-C8 (1991)
- SOARES, I. DAMIÃO**. Magnetohydrodynamic Cosmologies. *R. Portugal & I. Damiao Soares*. 380, 330, 182-D5 (1991)
- SODERBLOM, DAVID R.** The Chromospheric Emission-Age Relation for Stars of the Lower Main Sequence and Its Implications for the Star Formation Rate. *David R. Soderblom, Douglas K. Duncan, & Dean R. H. Johnson*. 375, 722, 121-F5 (1991)
- SOFFEL, M.** Testing Einstein's Theory of Gravity by Analyzing Lunar Laser Ranging Data. *J. Müller, M. Schneider, M. Soffel, & H. Ruder*. 382, L101, 211-E12 (1991)
- SOFIA, SABATINO**. Compressible Magnetic Convection: Formulation and Two-dimensional Models. *Peter A. Fox, Michael L. Theobald, & Sabatino Sofia*. 383, 860, 225-A1 (1991)
- SOFIA, ULYSSES J.** First Results from the Goddard High-Resolution Spectrograph: Elemental Abundances in the Diffuse Clouds toward ξ Persei. *Jason A. Cardelli, Blair D. Savage, Frederick C. Bruhwiler, Andrew M. Smith, Dennis C. Ebbets, Kenneth R. Sembach, & Ulysses J. Sofia*. 377, L57, 143-F11 (1991)
- SOIFER, B. T.** The Number Counts and Infrared Backgrounds from Infrared-bright Galaxies. *P. B. Hacking & B. T. Soifer*. 367, L49, 22-B7 (1991)
- Molecular Gas in Luminous Infrared Galaxies. *D. B. Sanders, N. Z. Scoville, & B. T. Soifer*. 370, 158, 49-B1 (1991)
- Very Small Grains and the Infrared Colors of Galaxies. *G. Helou, C. Ryter, & B. T. Soifer*. 376, 505, 132-F6 (1991)
- Near-Infrared Observations of the  $z \sim 2.3$  IRAS Source FSC 10214+4724. *B. T. Soifer, G. Neugebauer, J. R. Graham, K. Matthews, J. M. Mazzarella, C. J. Lonsdale, M. Rowan-Robinson, T. Broadhurst, A. Lawrence, & R. McMahon*. 381, L55, 199-D1 (1991)
- SOKER, NOAM**. Resonant Interaction in Common Envelopes. *Noam Soker*. 367, 593, 20-F1 (1991)
- Stripped Interstellar Gas in Cluster Cooling Flows. *Noam Soker, Joel N. Bregman, & Craig L. Sarazin*. 368, 341, 29-C10 (1991)
- Nonlinear Instability of the Accretion Line. *Noam Soker*. 376, 750, 135-F1 (1991)
- SOKOLOWSKI, JAMES**. Imaging Spectrophotometry of Ionized Gas in NGC 1068. II. Global Ionization of the Inner Disk. *Jonathan Bland-Hawthorn, James Sokolowski, & Gerald Cecil*. 375, 78, 112-A1 (1991)
- Imaging Spectrophotometry of Ionized Gas in NGC 1068. III. Anisotropic Excitation of the Large-Scale Disk by Scattering of Nuclear Continuum. *James Sokolowski, Jonathan Bland-Hawthorn, & Gerald Cecil*. 375, 583, 120-A1 (1991)
- SOKOLSKY, P.** See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- SOLF, J.** The Ultraviolet Continuum and the Fluorescent H<sub>2</sub> Lines in Low-Excitation Herbig-Haro Objects. *K.-H. Böhm, D. M. Scott, & J. Solf*. 371, 248, 63-C1 (1991)
- Spectroscopic Study of Direct and Dust-scattered Line Emission in the HH 1-HH 2 System. *J. Solf & K. H. Böhm*. 375, 618, 120-D3 (1991)
- SOLHEIM, J. E.** See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- SOLHEIM, J.-E.** See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- SOLOMON, P. M.** CO Excitation and H<sub>2</sub> Masses of Infrared-luminous Galaxies. *Simon J. E. Radford, P. M. Solomon, & D. Downes*. 368, L15, 28-C7 (1991)
- Star Formation and the Molecular Content of IC 342. *Leslie J. Sage & P. M. Solomon*. 380, 392, 183-B7 (1991)
- SON, Y. H.** See KRISHER, T. P., et al. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of Voyager 2.
- SONGAILA, ANTOINETTE**. Lyman- $\alpha$  Companions to High-z Quasars. *Esther M. Hu, Antoinette Songaila, Lennox L. Cowie, & Alan Stockton*. 368, 28, 23-D9 (1991)
- SONNEBORN, GEORGE**. Criteria for the Spectral Classification of B Stars in the Ultraviolet. *Janet Rountree & George Sonneborn*. 369, 515, 44-B5 (1991)
- Multiwavelength Observations of Nova LMC 1990 Number 2: The First Extragalactic Recurrent Nova. *Steven N. Shore, George Sonneborn, Sumner G. Starrfield, M. Hamuy, R. E. Williams, A. Cassatella, & H. Drechsel*. 370, 193, 49-E8 (1991)
- Premaximum Observations of the Type Ia SN 1990N. *Bruno Leibundgut, Robert P. Kirshner, Alexei V. Filippenko, Joseph C. Shields, Craig B. Foltz, Mark M. Phillips, & George Sonneborn*. 371, L23, 66-D1 (1991)
- SOUCAIL, GENEVIÈVE**. A Straight Gravitational Image in Abell 2390: A Striking Case of Lensing by a Cluster of Galaxies. *Roser Pellé, Jean-François Le Borgne, Geneviève Soucail, Yannick Mellier, & Blai Sanahuja*. 366, 405, 7-G9 (1991)
- Spectroscopy of the Gravitational Arcs in Cl 2244-02, A370 (Arclet A5), and Cl 0024+1654. *Yannick Mellier, Bernard Fort, Geneviève Soucail, Guy Mathey, & Mireille Cailloux*. 380, 334, 182-D10 (1991)
- SOUNDARARAJAPERUMAL, S.** EXOSAT Observations of the Seyfert 1 Galaxy NGC 3516. *K. K. Ghosh & S. Soundararajaperumal*. 383, 574, 221-D1 (1991)
- SOYUMER, DAVID**. See DUNCAN, DOUGLAS K., et al. Ca II H and K Measurements Made at Mount Wilson Observatory, 1966-1983.

- SPADARO, D. Nonequilibrium Ionization Effects in Asymmetrically Heated Loops. *D. Spadaro, S. K. Antiochos, & J. T. Mariska.* 382, 338, 204-D1 (1991)
- SPAGNA, GEORGE F., JR. Radiation Transport in Dust in Disk Geometry. I. Application to Externally Heated Interstellar Clouds. *George F. Spagna, Jr., Chun Ming Leung, & Michael P. Egan.* 379, 232, 166-A5 (1991)
- SPANGLER, S. R. VLA and VLBI Angular Broadening Measurements: The Distribution of Interstellar Scattering at Low Galactic Latitudes. *A. L. Fey, S. R. Spangler, & J. M. Cordes.* 372, 132, 75-F1 (1991)
- SPANGLER, STEVEN R. The Dissipation of Magnetohydrodynamic Turbulence Responsible for Interstellar Scintillation and the Heating of the Interstellar Medium. *Steven R. Spangler.* 376, 540, 133-B5 (1991)
- SPARKE, L. S. Influence of a Dark Halo on the Stability of Elliptical Galaxies. *M. Stiavelli & L. S. Sparke.* 382, 466, 207-D1 (1991)
- SPARKE, LINDA. Testing the Gravitational Field in Elliptical Galaxies: NGC 5077. *Francesco Bertola, Daniela Bettini, John Danziger, Elaine Sadler, Linda Sparke, & Tim de Zeeuw.* 373, 369, 92-E10 (1991)
- SPARKE, LINDA S. The Dark Halo of the Polar-Ring Galaxy NGC 4650A: Erratum. *Penny D. Sackett & Linda S. Sparke.* 371, 443, 65-F3 (1991) (Orig. paper in 361, 408, 163-B11 (1990))
- SPARKS, W. B. See MACCHETTO, F., et al. First Results from the Faint Object Camera: Observations of PKS 0521-36.
- See CRANE, P., et al. First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305.
- See JAKOBSEN, P., et al. First Results from the Faint Object Camera: SN 1987A.
- See PARESC, F., et al. First Results from the Faint Object Camera: Imaging the Core of R Aquarii.
- IC 5063: A Merger Remnant with a Hidden Luminous Active Nucleus. *L. Colina, W. B. Sparks, & F. Macchetto.* 370, 102, 48-C5 (1991)
- See MACCHETTO, F., et al. HST Observations of 3C 66B: A Double-stranded Optical Jet.
- Multiwavelength Isophotal Data for Southern Elliptical Galaxies. *W. B. Sparks, J. V. Wall, P. R. Jorden, D. J. Thorne, & I. van Breda.* 76, 471, 31-F11 (1991)
- See ALBRECHT, R., et al. First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System.
- See WEIGELT, G., et al. First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.
- A Radio-quiet Galaxy at Redshift  $z = 3.409$ . *D. A. Turnshek, F. Macchetto, M. V. Bencke, C. Hazard, W. B. Sparks, & R. G. McMahon.* 382, 26, 200-D1 (1991)
- SPARKS, WARREN M. See SAIZAR, PEDRO, et al. PW Vulpeculae: A Nova with Nearly Solar Abundances.
- SPENCER, J. H. Daily Observations of Compact Radio Sources at 2.7 and 8.1 GHz: 1979-1987. *E. B. Waltman, R. L. Fiedler, K. J. Johnston, J. H. Spencer, D. R. Florkowski, F. J. Josties, D. D. McCarthy, & D. N. Matsakis.* 77, 379, 49-G5 (1991)
- SERGEL, D. N. A Hydrodynamic Approach to Cosmology: Texture-seeded Cold Dark Matter and Hot Dark Matter Cosmogonies. *R. Y. Cen, J. P. Ostriker, D. N. Spergel, & N. Turok.* 383, 1, 212-B1 (1991)
- SERGEL, DAVID N. The Shape of the Galaxy. *Leo Blitz & David N. Spergel.* 370, 205, 49-F11 (1991)
- The Formation of Galaxies and Quasars in a Texture-seeded Cold Dark Matter Cosmogony. *Andrew K. Gooding, David N. Spergel, & Neil Turok.* 372, L5, 79-A13 (1991)
- Large-Scale Structure in a Texture-seeded Cold Dark Matter Cosmogony. *Changbom Park, David N. Spergel, & Neil Turok.* 372, L53, 85-B5 (1991)
- Direct Evidence for a Bar at the Galactic Center. *Leo Blitz & David N. Spergel.* 379, 631, 172-E1 (1991)
- SPIKER, T. R. See KRISHER, T. P., et al. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of Voyager 2.
- SPILLER, E. Flares Observed by the Normal Incidence X-Ray Telescope on 1989 September 11. *M. Herant, F. Pardo, E. Spiller, & L. Golub.* 376, 797, 136-C6 (1991)
- SPRUIT, HENDRIK C. Li Depletion in F Stars by Internal Gravity Waves. *Ramón J. García López & Hendrik C. Spruit.* 377, 268, 141-C7 (1991)
- SRAMEK, R. A. The Radio Recovery of SN 1970G in M101. *John J. Cowan, W. M. Goss, & R. A. Sramek.* 379, L49, 175-B5 (1991)
- SRAMEK, RICHARD A. The 10 Year Radio Light Curves for SN 1979C. *Kurt W. Weiler, Schuyler D. Van Dyk, Nino Panagia, Richard A. Sramek, & Jennifer L. Discenna.* 380, 161, 178-B1 (1991)
- SREEKANTAN, B. V. See ADARKAR, H., et al. Search for High-Energy Neutrinos from Celestial Sources in the Kolar Gold Fields Experiment.
- SREEKUMAR, P. Cosmic-Ray Distribution and the Dynamic Balance in the Large Magellanic Cloud. *Carl E. Fichtel, Mehmet E. Öznel, Robert G. Stone, & P. Sreekumar.* 374, 134, 99-F7 (1991)
- STABLEIN, CLAY. The Interoutburst Behavior of Cataclysmic Variables. *Paula Szkody, Janet A. Mattei, Elizabeth O. Waagen, & Clay Stablein.* 76, 359, 29-E1 (1991)
- STACEY, G. J. Parsec-Scale Penetration of Ultraviolet Photons into Molecular Clouds: [C II] 158 Micron Mapping of W3, NGC 1977, and NGC 2023. *J. E. Howe, D. T. Jaffe, R. Genzel, & G. J. Stacey.* 373, 158, 88-A5 (1991)
- The 158 Micron [C II] Line: A Measure of Global Star Formation Activity in Galaxies. *G. J. Stacey, N. Geis, R. Genzel, J. B. Lugten, A. Poglitsch, A. Sternberg, & C. H. Townes.* 373, 423, 93-C1 (1991)
- A Survey of the 158 Micron [C II] Fine-Structure Line in the Central 50 Parsecs of the Galaxy. *A. Poglitsch, G. J. Stacey, N. Geis, M. Haggerty, J. Jackson, M. Rumitz, R. Genzel, & C. H. Townes.* 374, L33, 110-B5 (1991)
- The Optical Depth of the 158 Micron [ $^{12}\text{C}$  II] Line: Detection of the  $F = 1 \rightarrow 0$  [ $^{13}\text{C}$  II] Hyperfine-Structure Component. *G. J. Stacey, C. H. Townes, A. Poglitsch, S. C. Madden, J. M. Jackson, F. Herrmann, R. Genzel, & N. Geis.* 382, L37, 205-E1 (1991)
- STAHLER, STEVEN W. The Evolution of Intermediate-Mass Protostars. I. Basic Results. *Francesco Palla & Steven W. Stahler.* 375, 288, 114-E1 (1991)
- STANDLEY, C. Measurements of the Diameter of the Supernova SN 1987A. *M. Karovska, P. Nisenson, C. Standley, & S. R. Heathcote.* 367, L15, 17-C8 (1991)
- STANEV, TODOR. Neutrino-heated Stars and Broad-Line Emission from Active Galactic Nuclei. *James MacDonald, Todor Stanev, & Peter L. Biermann.* 378, 30, 151-D4 (1991)
- Signatures of Cosmic-Ray Interactions on the Solar Surface. *D. Seckel, Todor Stanev, & T. K. Gaisser.* 382, 652, 209-F8 (1991)
- STANFORD, S. A. Dynamical Simulations of the Interacting Galaxies in the NGC 520/UGC 957 System. *S. A. Stanford & Marc Balcells.* 370, 118, 48-E5 (1991)
- A Near-Infrared Imaging Survey of Interacting Galaxies: The Disk-Disk Merger Candidates Subset. *S. A. Stanford & H. A. Bushouse.* 371, 92, 61-C1 (1991)
- Recent Star Formation in the Interacting Galaxy System NGC 520. *S. A. Stanford.* 381, 409, 195-G1 (1991)
- STANGA, R. Infrared Spectroscopy of T Tauri Stars. *C. Giovanardi, S. Gennari, A. Natta, & R. Stanga.* 367, 173, 14-B11 (1991)
- STANGA, R. M. Modeling an Accretion Disk in NGC 985. *R. M. Stanga, J. M. Rodríguez Espinosa, & F. Mannucci.* 379, 592, 172-A9 (1991)
- STANGHELLINI, C. What Are the Gigahertz Peaked-Spectrum Radio Sources? *C. P. O'Dea, S. A. Baum, & C. Stanghellini.* 380, 66, 176-G5 (1991)
- STANGHELLINI, LETIZIA. Post-Asymptotic Giant Branch Nonradial Instability Strips. *Letizia Stanghellini, Arthur N. Cox, & Sumner Starfield.* 383, 766, 223-F10 (1991)
- STAPELFELDT, KARL R. Near-Infrared Emission-Line Images of Three Herbig-Haro Objects. *Karl R. Stapelfeldt, Charles A. Beichman, J. Jeff Hester, Nicholas Z. Scoville, & Thomas N. Gautier III.* 371, 226, 63-A1 (1991)
- STARK, ANTONY A. An Unbiased Survey for Dense Cores in the Lynds 1630 Molecular Cloud. *Elizabeth A. Lada, John Bally, & Antony A. Stark.* 368, 432, 30-D9 (1991)
- STARK, G. High-Resolution Absorption Cross Sections of Carbon Monoxide Bands at 295 K between 91.7 and 100.4 Nanometers.

- G. Stark, K. Yoshino, Peter L. Smith, K. Ito, & W. H. Parkinson. 369, 574, 44-G13 (1991)
- STARK, M. J. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- STARKMAN, GLENN D. Primordial Nucleosynthesis without a Computer. Rahim Esmailzadeh, Glenn D. Starkman, & Savas Dimopoulos. 378, 504, 158-F7 (1991)
- STARFIELD, SUMNER. See SAIZAR, PEDRO, et al. PW Vulpeculae: A Nova with Nearly Solar Abundances. The Formation of  $^{26}$ Al Nova Explosions. Irit Nofar, Giora Shaviv, & Sumner Starrfield. 369, 440, 43-B11 (1991)
- Post-Asymptotic Giant Branch Nonradial Instability Strips. Letizia Stanghellini, Arthur N. Cox, & Sumner Starrfield. 383, 766, 223-F10 (1991)
- STARFIELD, SUMNER G. Multiwavelength Observations of Nova LMC 1990 Number 2: The First Extragalactic Recurrent Nova. Steven N. Shore, George Sonneborn, Sumner G. Starrfield, M. Hamuy, R. E. Williams, A. Cassatella, & H. Drechsel. 370, 193, 49-E8 (1991)
- Optical Identification of the X-Ray Source GS 2023+338 as V404 Cygni. R. Mark Wagner, Sumner G. Starrfield, Steve B. Howell, Tobias J. Kreidl, S. J. Bus, A. Cassatella, R. Bertram, & R. Fried. 378, 293, 154-E10 (1991)
- STAHLER, THOMAS S. Orbital Decay in Aspherical Galaxies. II. Triaxial Systems. Thomas S. Staehler. 375, 544, 119-E1 (1991)
- Is the Kinematically Distinct Core in NGC 5982 Necessarily the Remnant of an Accreted Companion? Thomas S. Staehler. 382, L11, 205-B7 (1991)
- STAUBERT, R. Low-Flux Hard X-Ray Observation of Cygnus X-1. P. Ubertini, A. Bazzano, C. La Padula, R. K. Manchanda, V. F. Polcaro, R. Staubert, E. Kendziorra, & F. Perotti. 383, 263, 215-D9 (1991)
- STAUFFER, JOHN. Spectroscopy of Taurus Cloud Brown Dwarf Candidates. John Stauffer, Terry Herter, Donald Hamilton, George H. Rieke, Marcia J. Rieke, Ron Probst, & William Forrest. 367, L23, 17-D7 (1991)
- Optical Excess Emission in T Tauri Stars. Patrick Hartigan, Scott J. Kenyon, Lee Hartmann, Stephen E. Strom, Suzan Edwards, Alan D. Wely, & John Stauffer. 382, 617, 209-C1 (1991)
- STAUFFER, JOHN R. The Chromospheric Activity of Low-Mass Stars in the Hyades. John R. Stauffer, Mark S. Giampapa, William Herbst, James M. Vincent, Lee W. Hartmann, & Robert A. Stern. 374, 142, 99-G1 (1991)
- STAVELEY-SMITH, L. See MOULD, J. R., et al. The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. I. Southern Clusters.
- STEBBINS, ALBERT. Did the Universe Recombine? James G. Bartlett & Albert Stebbins. 371, 8, 60-B9 (1991)
- STECHER, THEODORE P. See BOHLIN, RALPH C., et al. Simulated Optical Images of Galaxies at  $z \sim 1$  Using Ultraviolet Images of Nearby Galaxies.
- STECKER, F. W. On the Observability of the Gamma-Ray Line Flux from Dark Matter Annihilation. S. Rudaz & F. W. Stecker. 368, 406, 30-B5 (1991)
- STEIDEL, CHARLES C. Emission-Line and Continuum Properties of 92 Bright QSOs: Luminosity Dependence and Differences between Radio-selected and Optically Selected Samples. Charles C. Steidel & Wallace L. W. Sargent. 382, 433, 207-A1 (1991)
- STEIGMAN, GARY. Primordial Nucleosynthesis Redux. Terry P. Walker, Gary Steigman, David N. Schramm, Keith A. Olive, & Ho-Shik Kang. 376, 51, 125-F1 (1991)
- The Upper Bound to the Primordial Abundance of Helium and the Consistency of the Hot Big Bang Model. Keith A. Olive, Gary Steigman, & Terry P. Walker. 380, L1, 181-B1 (1991)
- STEIMAN-CAMERON, THOMAS. On the Evolution of Gravitationally Unstable Protostellar Disks. Leslie Tomley, Patrick Cassen, & Thomas Steiman-Cameron. 382, 530, 208-B6 (1991)
- STEIMAN-CAMERON, THOMAS Y. High-Speed Multicolor Photometry of V834 Centaurus. John Middleditch, James N. Imamura, Michael T. Wolff, & Thomas Y. Steiman-Cameron. 382, 315, 204-B1 (1991)
- STEIN, JOHN W. Multichannel Astrometric Photometer-based Parallaxes of Evolved Stars:  $\alpha$  Cygni, 51 Andromedae, and OP Andromedae. John W. Stein. 377, 669, 148-A5 (1991)
- STEIN, W. A. The Visual Wavelength Continua of Quasars: A Reexamination. W. A. Stein. 379, 107, 164-C11 (1991)
- STEIN, WAYNE A. Physical Models for the Hypothesized  $F(\nu) \propto \nu^{-1}$  Infrared to X-Ray Continuum of Quasi-stellar Objects. Wayne A. Stein. 373, 54, 86-F4 (1991)
- STEINHARDT, PAUL J. Coherent Peculiar Velocities and Periodic Redshifts. Christopher T. Hill, Paul J. Steinhardt, & Michael S. Turner. 366, L57, 11-B7 (1991)
- STEINOLFSOHN, R. S. Coronal Evolution Due to Shear Motion. R. S. Steinolfsohn. 382, 677, 210-A13 (1991)
- STELLA, L. Accretion Mechanisms in the Be/X-Ray Transient System A0535+26. C. Motch, L. Stella, E. Janot-Pacheco, & M. Mouchez. 369, 490, 43-G5 (1991)
- The Discovery of an X-Ray Burst and a Study of Aperiodic Variability from SMC X-1. L. Angelini, L. Stella, & N. E. White. 371, 332, 64-C1 (1991)
- Short-Term X-Ray Variability of the BL Lacertae Object PKS 2155-304: Power Spectrum and Cross-Correlation Analysis. G. Tagliaferri, L. Stella, L. Maraschi, A. Treves, & A. Celotti. 380, 78, 177-A5 (1991)
- STENCIL, R. E. Evolution of the Chromospheres and Winds of Low- and Intermediate-Mass Giant Stars. P. G. Judge & R. E. Stencil. 371, 357, 64-E3 (1991)
- New Low-Resolution Spectrometer Spectra for IRAS Sources. Kevin Volk, Sun Kwok, R. E. Stencil, & E. Brugel. 77, 607, 53-A1 (1991)
- STENCIL, ROBERT E. A Survey for Infrared Excesses among High Galactic Latitude SAO Stars. Robert E. Stencil & Dana E. Backman. 75, 905, 14-A1 (1991)
- STEPANOV, A. V. Consequences of Strong Pitch-Angle Diffusion of Particles in Solar Flares. P. A. Bespalov, V. V. Zaitsev, & A. V. Stepanov. 374, 369, 102-F5 (1991)
- STEPHEN, J. B. See UBERTINI, P., et al. "Superlow-State" Hard X-Ray Observation of Cygnus X-1.
- See BAZZANO, A., et al. Hard X-Rays from Coma Cluster Region: Erratum.
- See PEROTTI, F., et al. Hard X-Ray Variability of NGC 4151.
- STEPHENS, JOHN R. Hydrogenated Amorphous Carbon Grains and the 2175 Å Interstellar Hump. Armando Blanco, Ezio Bussolati, Luigi Colangeli, Sergio Fonti, & John R. Stephens. 382, L97, 211-E8 (1991)
- STEPHENS, S. A. CO (3-2) Mapping and Gas Excitation in the Core of M82. R. P. J. Tilanus, L. J. Tacconi, E. C. Sutton, S. Zhou, D. B. Sanders, C. G. Wynn-Williams, K. Y. Lo, & S. A. Stephens. 376, 500, 132-E13 (1991)
- Measurement of Cosmic-Ray Proton and Helium Spectra during the 1987 Solar Minimum. E. S. Seo, J. F. Ormes, R. E. Streitmatter, S. J. Stochaj, W. V. Jones, S. A. Stephens, & T. Bowen. 378, 763, 161-G1 (1991)
- STEPHENSON, C. B. The Case Low-Dispersion Northern Sky Survey. XII. A Region in Southern Canes Venatici. Peter Pesch, N. Sanduleak, & C. B. Stephenson. 76, 1043, 40-B1 (1991)
- STEPINSKI, T. F. Dynamo Magnetic Field Modes in Thin Astrophysical Disks: An Adiabatic Computational Approximation. T. F. Stepinski & E. H. Levy. 379, 343, 167-C9 (1991)
- STERLING, ALPHONSE C. Numerical Simulations of Microflare Evolution in the Solar Transition Region and Corona. Alphonse C. Sterling, John T. Mariska, Kazunari Shibata, & Yoshinori Suematsu. 381, 313, 192-G8 (1991)
- STERN, C. Ram-Pressure Stripping of the Multiphase Interstellar Medium of the Virgo Cluster Elliptical Galaxy M86 (NGC 4406). David A. White, A. C. Fabian, W. Forman, C. Jones, & C. Stern. 375, 35, 111-D9 (1991)
- STERN, C. P. An X-Ray and Radio Study of Steep-Spectrum Radio Sources. II. Four Fields from a 22 MHz Polar Cap Survey. P. E. Dewdney, C. H. Costain, I. McHardy, A. G. Willis, D. E. Harris, & C. P. Stern. 76, 1055, 40-D1 (1991)
- STERN, ROBERT A. The Chromospheric Activity of Low-Mass Stars in the Hyades. John R. Stauffer, Mark S. Giampapa, William Herbst,

- James M. Vincent, Lee W. Hartmann, & Robert A. Stern.* 374, 142, 99-G1 (1991)
- STERNBERG, A. High-Resolution Imaging of Brackett- $\gamma$  and H<sub>2</sub> 1-0 S(1) Emission in the Seyfert Galaxy NGC 1068. *V. Rotaciuc, A. Krabbe, M. Cameron, S. Drapatz, R. Genzel, A. Sternberg, & J. W. Storey.* 370, L23, 53-D6 (1991)
- The 158 Micron [C II] Line: A Measure of Global Star Formation Activity in Galaxies. *G. J. Stacey, N. Geis, R. Genzel, J. B. Lauer, A. Poglitsch, A. Sternberg, & C. H. Townes.* 373, 423, 93-C1 (1991)
- Near-Infrared Emission of Neutral Carbon from Photon-dominated Regions. *V. Escalante, A. Sternberg, & A. Dalgarno.* 375, 630, 120-E1 (1991)
- STEVENS, IAN R. Enhanced Winds and Tidal Streams in Massive X-Ray Binaries. *John M. Blondin, Ian R. Stevens, & Timothy R. Kallman.* 371, 684, 70-B1 (1991)
- X-Ray-illuminated Stellar Winds: Optically Thick Wind Models for Massive X-Ray Binaries. *Ian R. Stevens.* 379, 310, 167-A1 (1991)
- STEWART, G. C. See Kit, T., et al. X-Ray Continuum and Evidence for an Iron Emission Line from the Quasar E1821+643.
- STIAVELLI, M. Abundance Gradients and Galaxy Formation. *M. Stiavelli & F. Matteucci.* 377, L79, 150-C9 (1991)
- Influence of a Dark Halo on the Stability of Elliptical Galaxies. *M. Stiavelli & L. S. Sparke.* 382, 466, 207-D1 (1991)
- STICKEL, M. The Complete Sample of 1 Jansky BL Lacertae Objects. I. Summary Properties. *M. Stickel, P. Padovani, C. M. Urry, J. W. Fried, & H. Kühe.* 374, 431, 104-E1 (1991)
- Fanaroff-Riley I Galaxies as the Parent Population of BL Lacertae Objects. III. Radio Constraints. *C. M. Urry, P. Padovani, & M. Stickel.* 382, 501, 207-F13 (1991)
- STIENING, RAE F. Eclipse Studies of the Dwarf Nova HT Cassiopeiae. I. Observations and System Parameters. *Keith Horne, Janet H. Wood, & Rae F. Stiening.* 378, 271, 154-C11 (1991)
- V795 Herculis (=PG 1711+336). A Peculiar Intermediate Polar without Strong X-Ray Emission. *Erho Zhang, Edward L. Robinson, Tod F. Ramseier, Mathew D. Shetrone, & Rae F. Stiening.* 381, 534, 197-C10 (1991)
- STINEBRING, DANIEL R. Microstructure-determined Pulsar Dispersion Measures and the Problem of Profile Alignment. *Timothy H. Hankins, Vera A. Izvekova, Valerii M. Malofeev, Joanna M. Rankin, Yuri P. Shitov, & Daniel R. Stinebring.* 373, L17, 91-C1 (1991)
- STOCHAJ, S. J. Measurement of Cosmic-Ray Proton and Helium Spectra during the 1987 Solar Minimum. *E. S. Seo, J. F. Ormes, R. E. Streitmatter, S. J. Stochaj, W. V. Jones, S. A. Stephens, & T. Bowen.* 378, 763, 161-G1 (1991)
- A Measurement of the Cosmic-Ray  $^2\text{H}$  and  $^3\text{He}$  Spectra and  $^2\text{H}/^4\text{He}$  and  $^3\text{He}/^4\text{He}$  Ratios in 1989. *W. R. Webber, R. L. Golden, S. J. Stochaj, J. F. Ormes, & R. E. Streitmatter.* 380, 230, 178-G9 (1991)
- STOCKE, J. T. The Number Count Distribution for X-Ray-selected BL Lacertae Objects and Constraints on the Luminosity Function. *Anna Wolter, I. M. Gioia, T. Maccacaro, S. L. Morris, & J. T. Stocke.* 369, 314, 41-F5 (1991)
- STOCKE, JOHN T. New Observations of the Gas Cloud Associated with the Quasar-Galaxy Pair 3C 232/NGC 3067. *John T. Stocke, James Case, Megan Donahue, J. Michael Shull, & Theodore P. Snow.* 374, 72, 98-G7 (1991)
- The Properties of X-Ray-selected Active Galactic Nuclei. I. Luminosity Function, Cosmological Evolution, and Contribution to the Diffuse X-Ray Background. *Tommaso Maccacaro, Roberto Della Ceca, Isabella M. Gioia, Simon L. Morris, John T. Stocke, & Anna Wolter.* 374, 117, 99-D1 (1991)
- The Einstein Observatory Extended Medium-Sensitivity Survey. II. The Optical Identifications. *John T. Stocke, Simon L. Morris, I. M. Gioia, T. Maccacaro, R. Schild, A. Wolter, Thomas A. Fleming, & J. Patrick Henry.* 76, 813, 36-B1 (1991)
- The Luminosity Function and Cosmological Evolution of X-Ray-selected BL Lacertae Objects. *Simon L. Morris, John T. Stocke, Isabella M. Gioia, Rudy E. Schild, Anna Wolter, Tommaso Maccacaro, & Roberto Della Ceca.* 380, 49, 176-F1 (1991)
- STOCKMAN, H. S. Synchronization of the Magnetic Nova V1500 Cygni. *Gary D. Schmidt & H. S. Stockman.* 371, 749, 70-G7 (1991)
- STOKTON, ALAN. Lyman- $\alpha$  Companions to High-z Quasars. *Esther M. Hu, Antoinette Songaila, Lennox L. Cowie, & Alan Stockton.* 368, 28, 23-D9 (1991)
- OX 169: Evidence for a Recent Merger. *Alan Stockton & Tony Farnham.* 371, 525, 68-A13 (1991)
- STONE, EDWARD C. Coded-Aperture Imaging of the Galactic Center Region at Gamma-Ray Energies. *Walter R. Cook, John M. Grunsfeld, William A. Heindl, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone.* 372, L75, 85-D1 (1991)
- STONE, R. G. Multispacecraft Observations of Solar  $^3\text{He}$ -rich Events. *D. V. Reames, M.-B. Kallenrode, & R. G. Stone.* 380, 287, 179-G1 (1991)
- STONE, ROBERT G. Cosmic-Ray Distribution and the Dynamic Balance in the Large Magellanic Cloud. *Carl E. Fichsel, Mehmet E. Öz, Robert G. Stone, & P. Sreekumar.* 374, 134, 99-F7 (1991)
- STOREY, J. W. V. High-Resolution Imaging of Brackett- $\gamma$  and H<sub>2</sub> 1-0 S(1) Emission in the Seyfert Galaxy NGC 1068. *V. Rotaciuc, A. Krabbe, M. Cameron, S. Drapatz, R. Genzel, A. Sternberg, & J. W. V. Storey.* 370, L23, 53-D6 (1991)
- STORRS, ALEX D. Molecular Hydrogen in the Vicinity of NGC 7538 IRS 1 and IRS 2: Temperature and Ortho-to-Para Ratio. *Susan Hoban, Dennis C. Reuter, Michael J. Mumma, & Alex D. Storrs.* 370, 228, 50-A10 (1991)
- STORY, D. See FRANZ, O. G., et al. Binary Star Observations with the *Hubble Space Telescope* Fine Guidance Sensors. I. ADS 11300.
- STOTHERS, RICHARD B. Blue Loops during Core Helium Burning as the Consequence of Moderate Convective Envelope Overshooting in Stars of Intermediate to High Mass. *Richard B. Stothers & Chao-wen Chin.* 374, 288, 101-F3 (1991)
- Linear and Circular Digital Spectral Analysis of Serial Data. *Richard B. Stothers.* 375, 423, 116-B6 (1991)
- Evolutionary Sequences of Stellar Models of Intermediate and High Mass Including Convective Core Overshooting. *Chao-wen Chin & Richard B. Stothers.* 77, 299, 48-C1 (1991)
- Metal Opacities and Convective Core Overshooting in Population I Stars. *Richard B. Stothers & Chao-wen Chin.* 381, L67, 199-E7 (1991)
- Observational Tests of Convective Core Overshooting in Stars of Intermediate to High Mass in the Galaxy. *Richard B. Stothers.* 383, 820, 224-D8 (1991)
- STOUGHTON, ROLAND. Galaxy Velocity Dispersions Using a Cross-Correlation Method: Erratum. *Cristina Dalle Ore, S. M. Faber, J. Jesús González, Roland Stoughton, & David Burstein.* 375, 427, 116-B12 (1991) (Orig. paper in 366, 38, 1-E5 (1991))
- STOVER, RICHARD J. High-Speed Photometry of V404 Cygni in Outburst. *Eric Goethel, Joseph Patterson, & Richard J. Stover.* 374, 340, 102-C11 (1991)
- STRANIERO, OSCAR. Isochrones for H-burning Globular Cluster Stars. II. The Metallicity Range  $-2.3 < [\text{Fe}/\text{H}] < -0.5$ . *Oscar Straniero & Alessandro Chieffi.* 76, 525, 32-D1 (1991)
- STRAUSS, H. R. Three-dimensional Driven Reconnection in an Axially Bounded Magnetic Field. *H. R. Strauss.* 381, 508, 197-A8 (1991)
- STRAUSS, MICHAEL A. A Redshift Survey of *IRAS* Galaxies. II. Methods for Determining Self-consistent Velocity and Density Fields. *Amos Yahil, Michael A. Strauss, Marc Davis, & John P. Huchra.* 372, 380, 80-E5 (1991)
- A Redshift Survey of *IRAS* Galaxies. III. Reconstruction of the Velocity and Density Fields in N-Body Model Universes. *Marc Davis, Michael A. Strauss, & Amos Yahil.* 372, 394, 80-F7 (1991)
- A Redshift Survey of *IRAS* Galaxies. II. Methods for Determining Self-consistent Velocity and Density Fields: Erratum. *Amos Yahil, Michael A. Strauss, Marc Davis, & John P. Huchra.* 381, 348, 193-C10 (1991) (Orig. paper in 372, 380, 80-E5 (1991))
- STREITMATTER, R. E. Measurement of Cosmic-Ray Proton and Helium Spectra during the 1987 Solar Minimum. *E. S. Seo, J. F. Ormes, R. E. Streitmatter, S. J. Stochaj, W. V. Jones, S. A. Stephens, & T. Bowen.* 378, 763, 161-G1 (1991)
- STRINGFELLOW, GUY S. Brown Dwarfs in Young Stellar Clusters. *Guy S. Stringfellow.* 375, L21, 117-C7 (1991)
- STREITMATTER, R. E. A Measurement of the Cosmic-Ray  $^2\text{H}$  and  $^3\text{He}$  Spectra and  $^2\text{H}/^4\text{He}$  and  $^3\text{He}/^4\text{He}$  Ratios in 1989. *W. R. Webber, R. L. Golden, S. J. Stochaj, J. F. Ormes, & R. E. Streitmatter.* 380, 230, 178-G9 (1991)
- STROBEL, NICOLAS V. H II Regions in Seven Dwarf Irregular Galaxies.

- Nicolas V. Strobel, Paul Hodge, & Robert C. Kennicutt, Jr. 383, 148, 213-G3 (1991)
- STROHMAYER, T. The Shear Modulus of the Neutron Star Crust and Nonradial Oscillations of Neutron Stars. *T. Strohmayer, S. Ogata, H. Iyetomi, S. Ichimaru, & H. M. Van Horn.* 375, 679, 121-B7 (1991)
- STROHMAYER, TOD E. Oscillations of Rotating Neutron Stars. *Tod E. Strohmayer.* 372, 573, 82-G5 (1991)
- STROM, STEPHEN E. Testing Models of Low-Mass Star Formation: High-Resolution Far-Infrared Observations of L1551 IRS 5. *Harold M. Butner, Neal J. Evans II, Daniel F. Lester, Russell M. Leveault, & Stephen E. Strom.* 376, 636, 134-C6 (1991)
- Optical Excess Emission in T Tauri Stars. *Patrick Hartigan, Scott J. Kenyon, Lee Hartmann, Stephen E. Strom, Suzan Edwards, Alan D. Wely, & John Stauffer.* 382, 617, 209-C1 (1991)
- STRONG, K. T. See NITTA, N., et al. Coronal Magnetic Structures Observing Campaign. I. Simultaneous Microwave and Soft X-Ray Observations of Active Regions at the Solar Limb.
- STRONG, KEITH T. Coronal Dynamics of a Quiescent Active Region. *Julia L. R. Saba & Keith T. Strong.* 375, 789, 122-D9 (1991)
- STROOZAS, B. A. The Eclipsing AM Herculis Variable H1907+690. *R. A. Remillard, B. A. Stroozas, S. Tapia, & A. Silber.* 379, 715, 173-E13 (1991)
- STRUBLE, MITCHELL F. Superposition and Incompleteness Effects in Abell's Statistical Sample of Clusters. *Mitchell F. Struble & Herbert J. Rood.* 374, 395, 104-B5 (1991)
- A Compilation of Redshifts and Velocity Dispersions for Abell Clusters (Epoch 1991.2). *Mitchell F. Struble & Herbert J. Rood.* 77, 363, 49-F1 (1991)
- STRUCK-MARCELL, CURTIS. Hydrodynamic Constraints on the Radial Structure of Late-Type Galaxy Disks. *Curtis Struck-Marcell.* 368, 348, 29-D5 (1991)
- STRYKER, L. L. See SAIZAR, PEDRO, et al. PW Vulpeculae: A Nova with Nearly Solar Abundances.
- STUBBS, CHRISTOPHER W. See GRIEST, KIM, et al. Gravitational Microlensing as a Method of Detecting Disk Dark Matter and Faint Disk Stars.
- TURNER, STEVEN J. Existence of Scattering Atmospheres near Luminous, Magnetized Compact Objects. *Charles D. Dermer & Steven J. Turner.* 382, L23, 205-C11 (1991)
- STURROCK, P. A. Maximum Energy of Semi-infinite Magnetic Field Configurations. *P. A. Sturrock.* 380, 655, 186-C8 (1991)
- STUTZKI, J. First Observations of the CO  $J = 6-5$  Transition in Starburst Galaxies. *A. I. Harris, R. E. Hills, J. Stutzki, U. U. Graf, A. P. G. Russell, & R. Genzel.* 382, L75, 211-C7 (1991)
- SUEMATSU, YOSHINORI. Numerical Simulations of Microflare Evolution in the Solar Transition Region and Corona. *Alphonse C. Sterling, John T. Mariska, Kazunari Shibata, & Yoshinori Sueatsu.* 381, 313, 198-G8 (1991)
- SUESS, S. T. Magnetic Confinement, Alfvén Wave Reflection, and the Origins of X-Ray and Mass-Loss "Dividing Lines" for Late-Type Giants and Supergiants. *R. Rosner, C.-H. An, Z. E. Musielak, R. L. Moore, & S. T. Suess.* 372, L91, 85-E5 (1991)
- Alfvén Wave Trapping, Network Microflaring, and Heating in Solar Coronal Holes. *R. L. Moore, Z. E. Musielak, S. T. Suess, & C.-H. An.* 378, 347, 155-C5 (1991)
- SUGAI, HAJIME. A Catalog of Spin Orientation of Southern Galaxies. *Masanori Iye & Hajime Sugai.* 374, 112, 99-D3 (1991)
- SUGINOHARA, TATSUSHI. Cosmological N-Body Simulations with a Tree Code: Fluctuations in the Linear and Nonlinear Regimes. *Tatsushi Suginohara, Yasushi Suto, François R. Bouchet, & Lars Hernquist.* 75, 631, 10-B1 (1991)
- Redshift-Space Correlation Functions in the Cold Dark Matter Scenario. *Yasushi Suto & Tatsushi Suginohara.* 370, L15, 53-C7 (1991)
- Statistics of Peaks in Cosmological Nonlinear Density Fields. *Tatsushi Suginohara & Yasushi Suto.* 371, 470, 67-D1 (1991)
- SUGITANI, KOJI. A Catalog of Bright-rimmed Clouds with IRAS Point Sources: Candidates for Star Formation by Radiation-driven Implosion. I. The Northern Hemisphere. *Koji Sugitani, Yasuo Fukui, & Katsuuo Ogura.* 77, 59, 44-B1 (1991)
- SUGIYAMA, NAOSHI. Constraints on Open Universe Models from Quadrupole Anisotropy of the Cosmic Microwave Background. *Naoteru Gouda, Naoshi Sugiyama, & Misao Sasaki.* 372, L49, 85-B1 (1991)
- Anisotropies of the Cosmic Background Radiation by Domain Wall Networks. *Yasusada Nambu, Hideki Ishihara, Naoteru Gouda, & Naoshi Sugiyama.* 373, L35, 97-A1 (1991)
- SUKUMAR, S. Polarized Radio Emission from the Edge-on Spiral Galaxies NGC 891 and NGC 4565. *S. Sukumar & R. J. Allen.* 382, 100, 201-D1 (1991)
- SULENTIC, JACK W. Infrared Emission in Paired Galaxies. II. Luminosity Functions and Far-Infrared Properties. *Cong Xu & Jack W. Sulentic.* 374, 407, 104-C5 (1991)
- The Properties of NGC 2777: Are Companion Galaxies Young? *Halton Arp & Jack W. Sulentic.* 375, 569, 119-G1 (1991)
- SUN, W.-H. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- SUNDQVIST, B. Desorption of Large Molecules from Grains in Dense Interstellar Clouds. *R. E. Johnson, V. Pirronello, B. Sundqvist, & B. Donn.* 379, L75, 175-D12 (1991)
- SUNTZEFF, NICHOLAS B. Metal Abundances of RR Lyrae Variables in Selected Galactic Star Fields. V. The Lick Astrographic Fields at Intermediate Galactic Latitudes. *Nicholas B. Suntzeff, T. D. Kinman, & Robert P. Kraft.* 367, 528, 19-G13 (1991)
- Two Double-Mode RR Lyrae Stars in the Field. *Christine M. Clement, T. D. Kinman, & Nicholas B. Suntzeff.* 372, 273, 77-C13 (1991)
- Carbon Isotopic Abundances in Giant Stars in the CN-bimodal Globular Clusters NGC 6752 and M4. *Nicholas B. Suntzeff & Verne V. Smith.* 381, 160, 191-A8 (1991)
- SUNYAEV, R. See BARRET, D., et al. Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2. See BOUCHET, L., et al. SIGMA Discovery of Variable  $e^+e^-$  Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7-2942.
- Three Spectral States of 1E 1740.7-2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature. *R. Sunyaev, E. Churazov, M. Gilfanov, M. Pavlinsky, S. Grebenev, G. Babalyan, I. Dekhanov, N. Khavenson, L. Bouchet, P. Mandrou, J. P. Roques, G. Vedrenne, B. Cordier, A. Goldwurm, F. Lebrun, & J. Paul.* 383, L49, 226-C6 (1991)
- SUNYAEV, R. A. Do Clusters of Galaxies Affect the Spectrum of the Microwave Background? *M. Markevitch, G. R. Blumenthal, W. Forman, C. Jones, & R. A. Sunyaev.* 378, L33, 162-D1 (1991)
- SUTHERLAND, RALPH S. Oxygen Abundances in Halo Stars. *Michael S. Bessell, Ralph S. Sutherland, & Kui Ruan.* 383, L71, 226-E6 (1991)
- SUTO, H. Infrared Polarization Images of Star-forming Regions. I. The Ubiquity of Bipolar Structure. *M. Tamura, Ian Gailey, R. R. Joyce, M. Ueno, H. Suto, & M. Sekiguchi.* 378, 611, 160-A1 (1991)
- SUTO, MASAKO. 3.3 Micron Emission from Ultraviolet Excitation of Some Aromatic Molecules. *Jun Shan, Masako Suto, & L. C. Lee.* 383, 459, 218-A7 (1991)
- SUTO, YASUSHI. Application of the Ewald Method to Cosmological N-Body Simulations. *Lars Hernquist, François R. Bouchet, & Yasushi Suto.* 75, 231, 4-B1 (1991)
- Cosmological N-Body Simulations with a Tree Code: Fluctuations in the Linear and Nonlinear Regimes. *Tatsushi Suginohara, Yasushi Suto, François R. Bouchet, & Lars Hernquist.* 75, 631, 10-B1 (1991)
- Redshift-Space Correlation Functions in the Cold Dark Matter Scenario. *Yasushi Suto & Tatsushi Suginohara.* 370, L15, 53-C7 (1991)
- Statistics of Peaks in Cosmological Nonlinear Density Fields. *Tatsushi Suginohara & Yasushi Suto.* 371, 470, 67-D1 (1991)
- Baryon Isocurvature Scenario in Inflationary Cosmology: A Particle Physics Model and Its Astrophysical Implications. *Jun'ichi Yokoyama & Yasushi Suto.* 379, 427, 170-B1 (1991)
- SUTTON, E. C. CO (3-2) Mapping and Gas Excitation in the Core of M82. *R. P. J. Tilanus, L. J. Tacconi, E. C. Sutton, S. Zhou, D. B. Sanders, C. G. Wynn-Williams, K. Y. Lo, & S. A. Stephens.* 376, 500, 132-E13 (1991)
- Molecular Line Survey of Sagittarius B2(M) from 330 to 355 GHz and Comparison with Sagittarius B2(N). *E. C. Sutton, P. A. Jaminet, W. C. Danchi, & Geoffrey A. Blake.* 77, 255, 47-F1 (1991)

- CO J = 3-2 and J = 2-1 Observations of NGC 7027.** *P. A. Jaminet, W. C. Danchi, E. C. Sutton, A. P. G. Russell, Göran Sandell, J. H. Bieging, & D. Wilner.* 380, 461, 184-A4 (1991)
- SUZUKI, HIROKO.** See OHISHI, MASATOSHI, et al. Detection of a New Carbon-Chain Molecule, CCO.
- SVENSSON, ROLAND.** Bursts of Gamma Rays from Compton Scattering at Cosmological Distances. *Andrzej A. Zdziarski, Roland Svensson, & Bohdan Paczyński.* 366, 343, 7-B3 (1991)
- A Recipe for Making Hot Accretion Disks. *Gunnlaugur Björnsson & Roland Svensson.* 371, L69, 73-C10 (1991)
- SWANK, J. H.** Shot Model Parameters for Cygnus X-1 through Phase Portrait Fitting. *James C. Lochner, J. H. Swank, & A. E. Szymkowiak.* 376, 295, 128-E9 (1991)
- SWANSON, STEVEN R.** A Spectrophotometric Atlas of White Dwarfs Compiled from the IUE Archives. *Gary Wegner & Steven R. Swanson.* 75, 507, 7-E13 (1991)
- SWARTZ, DOUGLAS A.** Ionization by High-Energy Particles and the Electron Scattering Opacity in Supernovae. *Douglas A. Swartz.* 373, 604, 95-D11 (1991)
- Model Light Curves of Linear Type II Supernovae. *Douglas A. Swartz, J. Craig Wheeler, & Robert P. Harkness.* 374, 266, 101-D7 (1991)
- The Late-Time Light Curve of SN 1984L. *Douglas A. Swartz & J. Craig Wheeler.* 379, L13, 169-B7 (1991)
- SWEETNAM, D. N.** See KRISHER, T. P., et al. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of Voyager 2.
- SWORDY, SIMON P.** Energy Spectra and Composition of Primary Cosmic Rays. *Dietrich Müller, Simon P. Swurdy, Peter Meyer, Jacques L'Heureux, & John M. Grunsfeld.* 374, 356, 102-E1 (1991)
- SZABELSKA, B.** Cosmic Rays and Cosmological Microwave Background Fluctuations. *A. J. Banday, M. Giler, B. Szabelska, J. Szabelski, & A. W. Wolfendale.* 375, 432, 118-B5 (1991)
- SZABELSKI, J.** Cosmic Rays and Cosmological Microwave Background Fluctuations. *A. J. Banday, M. Giler, B. Szabelska, J. Szabelski, & A. W. Wolfendale.* 375, 432, 118-B5 (1991)
- SZABO, A. P.** Cosmic-Ray Transport and Gamma-Ray Emission in Supernova Shells. *A. K. Harding, A. Mastichiadis, R. J. Protheroe, & A. P. Szabo.* 378, 163, 153-A9 (1991)
- SZKODY, PAULA.** A Study of the Ultraviolet Evolution of U Geminorum between Outbursts. *Alan L. Kiplinger, Edward M. Sion, & Paula Szkody.* 366, 569, 10-B1 (1991)
- Near-Infrared Time-resolved Spectroscopy of the Cataclysmic Variable YY Draconis. *Mario Mateo, Paula Szkody, & Peter Garnavich.* 370, 370, 51-G8 (1991)
- The Interburst Behavior of Cataclysmic Variables. *Paula Szkody, Janet A. Mattei, Elizabeth O. Waagen, & Clay Stahle.* 76, 359, 29-E1 (1991)
- SZOMORU, ARPAD.** On the Population of H I Dwarf Galaxies. *David H. Weinberg, Arpad Szomoru, P. Guhathakurta, & J. H. van Gorkom.* 372, L13, 79-B11 (1991)
- SYZMKOWIAK, A. E.** Shot Model Parameters for Cygnus X-1 through Phase Portrait Fitting. *James C. Lochner, J. H. Swank, & A. E. Szymkowiak.* 376, 295, 128-E9 (1991)
- TAAM, RONALD E.** The Response of Main-Sequence Stars within a Common Envelope. *Michael S. Hjellming & Ronald E. Taam.* 370, 709, 57-C1 (1991)
- Accretion in Wind-driven X-Ray Sources. *Ronald E. Taam, Albert Fu, & B. A. Fryxell.* 371, 696, 70-C1 (1991)
- Double Core Evolution. IV. The Late Stages of Evolution of a 2  $M_{\odot}$  Red Giant with a 1  $M_{\odot}$  Companion. *Ronald E. Taam & Peter Bodenheimer.* 373, 246, 89-A10 (1991)
- TACCONI, L. J.** CO (3-2) Mapping and Gas Excitation in the Core of M82. *R. P. J. Tilanus, L. J. Tacconi, E. C. Sutton, S. Zhou, D. B. Sanders, C. G. Wynn-Williams, K. Y. Lo, & S. A. Stephens.* 376, 500, 132-E13 (1991)
- TAGLIAFERRI, G.** Coordinated X-Ray, Ultraviolet, and Optical Observations of 3C 120. *L. Maraschi, L. Chiappetti, R. Falomo, B. Garilli, M. Malkan, G. Tagliaferri, E. G. Tanzi, & A. Treves.* 368, 138, 24-F9 (1991)
- See GIOMMI, P., et al. The EXOSAT High Galactic Latitude Survey.
- Short-Term X-Ray Variability of the BL Lacertae Object PKS 2155-304: Power Spectrum and Cross-Correlation Analysis. *G. Tagliaferri, L. Stella, L. Maraschi, A. Treves, & A. Celotti.* 380, 78, 177-A5 (1991)
- TAJIMA, T.** Numerical Study of Compressible Solar Magnetoconvection with an Open Transitional Boundary. *H. Hanami & T. Tajima.* 377, 694, 148-C6 (1991)
- A Mechanism for Gamma-Ray Bursts by Alfvén-Wave Acceleration in Nonuniform Atmosphere. *K. A. Holcomb & T. Tajima.* 378, 682, 160-G10 (1991)
- Propagation of Magnetoacoustic Waves in the Solar Atmosphere with Random Inhomogeneities of Density and Magnetic Fields. *M. Ryutova, M. Kaisig, & T. Tajima.* 380, 268, 179-D1 (1991)
- TAKAHASHI, N.** See KOYAMA, K., et al. An X-Ray Pulsator in the Direction of Molecular Cloud MBM 12 (Lynds 1457).
- TAKAHASHI, T.** See MURAKI, Y., et al. Observations of Ultra-High-Energy Photons from Cygnus X-3.
- TAKAHASHI, TAKAMASA.** Low-Density Photodissociation Regions. *David J. Hollenbach, Takamasa Takahashi, & A. G. G. M. Tielens.* 377, 192, 140-C11 (1991)
- TAKAKUBO, KEIYA.** U-shaped Outflow in the Lynds 1221 Dark Cloud: An Example of Interaction of Outflows with Ambient Molecular Clouds. *Tomofumi Umemoto, Naomi Hirano, Osamu Kameya, Yasuo Fukui, Nario Kuno, & Keiya Takakubo.* 377, 510, 146-A13 (1991)
- TAKAMIYA, MARIANNE Y.** ESO 207-61: A Brown Dwarf Candidate in the Hyades Moving Group. *María Teresa Ruiz, Marianne Y. Takamiya, & Miguel Roth.* 367, L59, 22-C7 (1991)
- TAKANO, S.** See KII, T., et al. X-Ray Continuum and Evidence for an Iron Emission Line from the Quasar E1821+643.
- See KOYAMA, K., et al. An X-Ray Pulsator in the Direction of Molecular Cloud MBM 12 (Lynds 1457).
- TAKEDA, K.** Measurement of the Neutron Capture Rate of the  $^{12}\text{C}(n, \gamma)^{13}\text{C}$  Reaction at Stellar Energy. *Y. Nagai, M. Igashira, K. Takeda, N. Mukai, S. Motoyama, F. Uesawa, H. Kitazawa, & T. Fukuda.* 372, 683, 84-B7 (1991)
- See NAGAI, Y., et al. Capture Rate of the  $^7\text{Li}(n, \gamma)^8\text{Li}$  Reaction by Prompt Gamma-Ray Detection.
- TAKEUCHI, Y.** Discovery of 111 Second Pulsation from the X-Ray Source Scutum X-1. *K. Koyama, H. Kunieda, Y. Takeuchi, & Y. Tawara.* 370, L77, 59-D1 (1991)
- TALBI, D.** Calculations Concerning the Reaction  $\text{C} + \text{H}_3^+ \rightarrow \text{CH}^+ + \text{H}_2$ . *D. Talbi, D. J. DeFrees, D. A. Egolf, & Eric Herbst.* 374, 390, 103-A1 (1991)
- TAMURA, K.** See NAGASE, F., et al. Cyclotron Line Features in the Spectrum of the Transient X-Ray Pulsar X0115+634.
- TAMURA, M.** Near-Infrared Long-Slit Spectra of NGC 1068. *M. Tamura, S. G. Kleinmann, N. Z. Scoville, & R. R. Joyce.* 371, 131, 61-F3 (1991)
- Infrared Polarization Images of Star-forming Regions. I. The Ubiquity of Bipolar Structure. *M. Tamura, Ian Gailey, R. R. Joyce, M. Ueno, H. Suto, & M. Sekiguchi.* 378, 611, 160-A1 (1991)
- TAMURA, MOTOHIDE.** The Dense, Inner Part of the Protostellar Disk: Protostellar Candidates in GGD 27 IRS. *Takuya Yamashita, Yasuhiro Murata, Ryohji Kawabe, Norio Kaiju, & Motohide Tamura.* 373, 560, 95-A1 (1991)
- Two Micron Morphology of Candidate Protostars. *Motohide Tamura, Ian Gailey, William Waller, & Michael W. Werner.* 374, L25, 103-E7 (1991)
- TAN, J.** Changes in the 11 Minute Period of 4U 1820-30. *J. Tan, E. Morgan, W. H. G. Lewin, W. Penninx, M. van der Klis, J. van Paradijs, K. Makishima, H. Inoue, T. Dotani, & K. Mitsuda.* 374, 291, 101-F6 (1991)
- TANABÉ, TOSHIHIKO.** The SiH Vibrational Stretch as an Indicator of the Chemical State of Interstellar Grains. *Marla H. Moore, Toshihiko Tanabé, & Joseph A. Nuth.* 373, L31, 91-D7 (1991)
- TANAKA, K.** See ADARKAR, H., et al. Search for High-Energy Neutrinos from Celestial Sources in the Kolar Gold Fields Experiment.
- TANAKA, MASUO.** Infrared Fluorescence of H<sub>2</sub> in NGC 6240: A Starburst Origin for the H<sub>2</sub> Luminosity. *Masuo Tanaka, Tetsuo Hasegawa, & Ian Gailey.* 374, 516, 105-E9 (1991)

- TANAKA, Y. See KII, T., et al. X-Ray Continuum and Evidence for an Iron Emission Line from the Quasar E1821+643.
- See NAGASE, F., et al. Cyclotron Line Features in the Spectrum of the Transient X-Ray Pulsar X0115+634.
- Discovery of a Cyclotron Resonance Feature at 30 keV from the Transient X-Ray Pulsar Cepheus X-4. *T. Mihara, K. Makishima, S. Kamijo, T. Ohashi, F. Nagase, Y. Tanaka, & K. Koyama.* 379, L61, 175-C6 (1991)
- TANG, FRANCES. Motions, Fields, and Flares in the 1989 March Active Region. *Haimin Wang, Frances Tang, Harold Zirin, & Guoxiang Ai.* 380, 282, 179-E1 (1991)
- TANZI, E. G. Coordinated X-Ray, Ultraviolet, and Optical Observations of 3C 120. *L. Maraschi, L. Chiappetti, R. Falomo, B. Garilli, M. Malkan, G. Tagliaferri, E. G. Tanzi, & A. Treves.* 368, 138, 24-F9 (1991)
- On the Nebulosity Surrounding the BL Lacertae Object PKS 2155-304. *R. Falomo, E. Giraud, L. Maraschi, J. Melnick, E. G. Tanzi, & A. Treves.* 380, L67, 188-D1 (1991)
- TAO, CHARLING. A Critical Look at Cosmions. *Jean Kaplan, François Martin de Volnay, Charling Tao, & Sylvaine Turck-Chieze.* 378, 315, 154-G11 (1991)
- TAPIA, M. The Interstellar C-H Stretching Band near 3.4 Microns: Constraints on the Composition of Organic Material in the Diffuse Interstellar Medium. *S. A. Sandford, L. J. Allamandola, A. G. G. M. Tielens, K. Sellgren, M. Tapia, & Y. Pendleton.* 371, 607, 69-B1 (1991)
- TAPIA, MAURICIO. Observations That Link Infrared Cirrus and Ultraviolet Extinction. *John A. Hackwell, James H. Hecht, & Mauricio Tapia.* 375, 163, 113-A9 (1991)
- TAPIA, S. Optical Polarization of a Complete Sample of Radio Sources. *C. D. Impey, C. R. Lawrence, & S. Tapia.* 375, 46, 111-E10 (1991)
- The Eclipsing AM Herculis Variable H1907+690. *R. A. Remillard, B. A. Stroozas, S. Tapia, & A. Silber.* 379, 715, 173-E13 (1991)
- TARAFDAR, SHANKAR P. Dynamical Evolution and Molecular Abundances of Interstellar Clouds. *Sheo S. Prasad, Karen R. Heere, & Shankar P. Tarafdar.* 373, 123, 87-E5 (1991)
- TARUSAWA, K. The Distance to the Coma Cluster Using the B-Band Tully-Fisher Relation. *M. Fukugita, S. Okamura, K. Tarusawa, H. J. Rood, & B. A. Williams.* 376, 8, 125-B9 (1991)
- TASSOUL, M. Adiabatic Properties of Pulsating DA White Dwarfs. I. The Treatment of the Brunt-Väisälä Frequency and the Region of Period Formation. *P. Brassard, G. Fontaine, F. Wesemael, S. D. Kawaler, & M. Tassoul.* 367, 601, 20-F11 (1991)
- TATEMATSU, K. See KOYAMA, K., et al. An X-Ray Pulsator in the Direction of Molecular Cloud MBM 12 (Lynds 1457).
- TATUM, JEREMY B. Analysis of the Swings Effect and Greenstein Effect in Comet P/Halley. *Wayne A. Jaworski & Jeremy B. Tatum.* 377, 306, 141-F11 (1991)
- TAUBER, JAN A. The Smoothness of CO Line Profiles in Orion: Implications for Clumpiness. *Jan A. Tauber, Paul F. Goldsmith, & Robert L. Dickman.* 375, 635, 120-E7 (1991)
- TAVANI, MARCO. On the Nature and Evolution of the Windy Binary Pulsar PSR 1744-24A. *Jacob Shaham & Marco Tavani.* 377, 588, 147-A11 (1991)
- "Hidden" Millisecond Pulsars. *Marco Tavani.* 379, L69, 175-D5 (1991)
- Outflow Hydrodynamics in the Eclipsing Millisecond Pulsar Binaries PSR 1957+20 and PSR 1744-24A. *Marco Tavani & Leigh Brookshaw.* 381, L21, 194-C13 (1991)
- TAWARA, Y. Discovery of 111 Second Pulsation from the X-Ray Source Scutum X-1. *K. Koyama, H. Kunieda, Y. Takeuchi, & Y. Tawara.* 370, L77, 59-D1 (1991)
- See KOYAMA, K., et al. An X-Ray Pulsator in the Direction of Molecular Cloud MBM 12 (Lynds 1457).
- TAWARA, YUZURU. Discovery of Periodic Eclipses in the X-Ray Pulsar 1H 0253+193. *Yuichi Kamata, Yuzuru Tawara, & Katsushi Koyama.* 379, L65, 175-C13 (1991)
- TAYAL, S. S. Fe XII Line Ratios in Solar Flares. *S. S. Taya, Ronald J. W. Henry, F. P. Keenan, S. M. McCann, & K. G. Widing.* 369, 567, 44-G1 (1991)
- TAYLOR, A. H. See KRISHER, T. P., et al. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of Voyager 2.
- TAYLOR, A. R. AG Pegasi: A Multishell Radio Source. *H. T. Kenny, A. R. Taylor, & E. R. Sequist.* 366, 549, 9-G7 (1991)
- TAYLOR, ANTHONY H. Voyager 2 Test of the Radar Time-Delay Effect. *Timothy P. Krisher, John D. Anderson, & Anthony H. Taylor.* 373, 665, 96-C1 (1991)
- TAYLOR, BENJAMIN J. A Critical Appraisal of Published Values of [Fe/H] for K II-IV Stars. *Benjamin J. Taylor.* 76, 715, 34-E12 (1991)
- TAYLOR, J. H. On the Orbital Period Change of the Binary Pulsar PSR 1913+16. *Thibault Damour & J. H. Taylor.* 366, 501, 9-C1 (1991)
- High-Precision Timing of Millisecond Pulsars. I. Astrometry and Masses of the PSR 1855+09 System. *M. F. Ryba & J. H. Taylor.* 371, 739, 70-F9 (1991)
- High-Precision Timing of Millisecond Pulsars. II. Astrometry, Orbital Evolution, and Eclipses of PSR 1957+20. *M. F. Ryba & J. H. Taylor.* 380, 557, 185-B7 (1991)
- TAYLOR, M. On the Wind Geometry of the Wolf-Rayet Star EZ Canis Majoris. *R. E. Schulte-Ladbeck, K. H. Nordsieck, M. Taylor, M. A. Nook, K. S. Bjorkman, A. M. Magalhães, & C. M. Anderson.* 382, 301, 204-A1 (1991)
- First Ultraviolet Spectropolarimetry of Hot Supergiants. *M. Taylor, A. D. Code, K. H. Nordsieck, C. M. Anderson, B. L. Babler, K. S. Bjorkman, G. C. Clayton, A. M. Magalhães, M. R. Meade, R. E. Schulte-Ladbeck, & B. A. Whitney.* 382, L85, 211-D5 (1991)
- See BJORKMAN, K. S., et al. First Ultraviolet Spectropolarimetry of Be Stars from the Wisconsin Ultraviolet Photo-Polarimeter Experiment.
- TEEGARDEN, B. J. GRIS Observations of  $^{26}\text{Al}$  Gamma-Ray Line Emission from Two Points in the Galactic Plane. *B. J. Teegarden, S. D. Barthelmy, N. Gehrels, J. Tueller, M. Leventhal, & C. J. MacCallum.* 375, L9, 117-B4 (1991)
- GRIS Observations of Positron Annihilation Radiation from the Galactic Center. *N. Gehrels, S. D. Barthelmy, B. J. Teegarden, J. Tueller, M. Leventhal, & C. J. MacCallum.* 375, L13, 117-B10 (1991)
- TEGLER, STEPHEN C. Nitrogen Abundance in Comet Halley. *Susan Wyckoff, Stephen C. Tegler, & Lisa Engel.* 367, 641, 21-C1 (1991)
- Ammonia Abundances in Four Comets. *Susan Wyckoff, Stephen C. Tegler, & Lisa Engel.* 368, 279, 26-E5 (1991)
- TELESCO, C. M. Infrared Mapping of M82: A Starburst in an Edge-on Barred Galaxy. *C. M. Telesco, H. Campins, M. Joy, K. Dietz, & R. Decher.* 369, 135, 37-E11 (1991)
- Detection of Silicates in the  $\beta$  Pictoris Disk. *C. M. Telesco & R. F. Knacke.* 372, L29, 79-D7 (1991)
- TENNYSON, JONATHAN. Infrared Emissions of  $\text{H}_3^+$  in the Atmosphere of Jupiter in the 2.1 and 4.0 Micron Region: Erratum. *Steven Miller, Robert D. Joseph, & Jonathan Tennyson.* 367, L37, 17-F1 (1991) (Orig. paper in 360, L55, 156-E1 (1990))
- A Table of Astronomically Important Ro-vibrational Transitions for the  $\text{H}_3^+$  Molecular Ion. *Lancelot Kao, Takeshi Oka, Steven Miller, & Jonathan Tennyson.* 77, 317, 48-E1 (1991)
- TENORIO, L. See SMOOTH, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- TERASAWA, NOBUO. Origin of Cosmic X-Ray Background Radiation. *Nobuo Terasawa.* 378, L11, 157-B8 (1991)
- TERASANTA, H. See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- TERNDRUP, D. M. Galactic Bulge M Giants. IV. 0.5-2.5 Micron Spectrophotometry and Abundances for Stars in Baade's Window. *D. M. Terndrup, Jay A. Frogel, & A. E. Whitford.* 378, 742, 161-E5 (1991)
- TERNDRUP, DONALD M. The Metallicity of RR Lyrae Stars in Baade's Window. *Alistair R. Walker & Donald M. Terndrup.* 378, 119, 152-D13 (1991)
- TERZIAN, YERVANT. A Cool Supergiant with Anomalous Behavior of the 2800 Mg II Doublet. *G. A. Gurzadyan, Y. Kondo, S. S. Rustambekyan, Yervant Terzian, & Mario R. Perez.* 378, 298, 154-F1 (1991)

- High-Resolution Spectroscopy of Partially Ionized Gas around H II Regions. *Joseph S. Onello, J. A. Phillips, & Yervant Terzian.* 383, 693, 222-G6 (1991)
- TESHIMA, Y. A Study of  $^{13}\text{CO}$  Cloud Cores in Ophiuchus. *S. Nozawa, A. Mizuno, Y. Teshima, H. Ogawa, & Y. Fukui.* 77, 647, 53-E6 (1991)
- TESKE, RICHARD G. Forbidden Iron Emission on the North Rim of IC 443. *Richard G. Teske.* 383, 233, 215-A1 (1991)
- TEUKOLSKY, SAUL A. Explosion of a Rotating Neutron Star near the Minimum Mass. *Monica Colpi, Stuart L. Shapiro, & Saul A. Teukolsky.* 369, 422, 43-A5 (1991)
- THADDEUS, P. A  $^{12}\text{CO}$  Survey of the Small Magellanic Cloud. *M. Rubio, G. Garay, J. Montani, & P. Thaddeus.* 368, 173, 25-C1 (1991)
- The Millimeter-Wave Spectrum of Highly vibrationally Excited SiO. *R. Mollaaghataba, C. A. Gottlieb, J. M. Vrilek, & P. Thaddeus.* 368, L19, 28-D1 (1991)
- Astronomical Detection of  $\text{H}_2\text{CCC}$ . *J. Cernicharo, C. A. Gottlieb, M. Guélin, T. C. Killian, G. Paubert, P. Thaddeus, & J. M. Vrilek.* 368, L39, 35-C7 (1991)
- Astronomical Detection of  $\text{H}_2\text{CCCC}$ . *J. Cernicharo, C. A. Gottlieb, M. Guélin, T. C. Killian, P. Thaddeus, & J. M. Vrilek.* 368, L43, 35-C11 (1991)
- A Complete CO Survey of M31. *E. Koper, T. M. Dame, F. P. Israel, & P. Thaddeus.* 383, L11, 219-B7 (1991)
- THE, LIH-SIN. Bremsstrahlung and Energetic Electrons in Supernovae. *Donald D. Clayton & Lih-Sin The.* 375, 221, 113-F12 (1991)
- THE, P. S. IRAS 17380-3031: A New Dusty Late WC-Type Wolf-Rayet Star. *Martin Cohen, K. A. van der Hucht, P. M. Williams, & P. S. The.* 378, 302, 154-F7 (1991)
- THEILL, PETER. A Critical Analysis of the Ultraviolet Temperature Scale of the Helium-dominated DB and DBV White Dwarfs. *Peter Theill, Stéphane Vennes, & Harry L. Shipman.* 370, 355, 51-F5 (1991)
- The Binary Feige 24: The Mass, Radius, and Gravitational Redshift of the DA White Dwarf. *Stéphane Vennes, John R. Thorstensen, Peter Theill, & Harry L. Shipman.* 372, L37, 79-E5 (1991)
- THEOBALD, MICHAEL L. Compressible Magnetic Convection: Formulation and Two-dimensional Models. *Peter A. Fox, Michael L. Theobald, & Sabatino Sofia.* 383, 860, 225-A1 (1991)
- THIBAUD, J. P. On the Sodium Excess in the Atmospheres of Yellow Supergiants. *N. Prantzos, A. Coc, & J. P. Thibaud.* 379, 729, 173-G1 (1991)
- THIELE, U. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- THIELEMANN, F.-K. Shock Waves and Nucleosynthesis in Type II Supernovae. *M. B. Aufderheide, E. Baron, & F.-K. Thielemann.* 370, 630, 56-C8 (1991)
- THOLEN, D. J. The Infrared and Optical Pulsations of G29-38. *Joseph Patterson, B. Zuckerman, E. E. Becklin, D. J. Tholen, & T. Hawarden.* 374, 330, 102-C1 (1991)
- THOMAS, H.-C. See GIOMMI, P., et al. The EXOSAT High Galactic Latitude Survey.
- THOMAS, JOHN H. Siphon Flows in Isolated Magnetic Flux Tubes. IV. Critical Flows with Standing Tube Shocks. *John H. Thomas & Benjamin Montesinos.* 375, 404, 115-G11 (1991)
- THOMAS, S. B. See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- THOMPSON, D. J. Discovery of a Normal Galaxy at  $z = 1.018$ . *D. J. Thompson & S. Djorgovski.* 371, L55, 73-B6 (1991)
- THOMPSON, D. T. The Brightness, Albedo, and Temporal Variability of Neptune. *G. W. Lockwood, D. T. Thompson, B. L. Lutz, & E. S. Howell.* 368, 287, 26-F1 (1991)
- THOMPSON, IAN B. Globular Cluster Mass Functions. *Harvey B. Richer, Gregory G. Fahlman, Roberto Buonanno, Flavio Fusi Pecci, Leonard Searle, & Ian B. Thompson.* 381, 147, 190-G7 (1991)
- THOMPSON, KEITH L. Broad Na D Emission in QSOs and the Profile of He I  $\lambda 5876$ . *Keith L. Thompson.* 374, 496, 105-C7 (1991)
- THOMPSON, M. J. The Response of the Adiabatic Exponent  $\Gamma_1$  to Modifications of Solar Models. *J. Christensen-Dalsgaard & M. J. Thompson.* 367, 666, 21-E4 (1991)
- The Depth of the Solar Convection Zone. *J. Christensen-Dalsgaard, D. O. Gough, & M. J. Thompson.* 378, 413, 156-B4 (1991)
- THOMPSON, R. J., JR. The Proper Motion of the Soft X-Ray-emitting Radio Pulsar PSR 0656+14. *R. J. Thompson, Jr., F. A. Córdova, R. M. Hjellming, & E. B. Fomalont.* 366, L83, 11-E1 (1991)
- THOMSON, D. J. Statistical Properties of Shock-accelerated Ions in the Outer Heliosphere. *L. J. Lanzerotti, R. E. Gold, D. J. Thomson, R. E. Decker, C. G. MacLennan, & S. M. Krimigis.* 380, L93, 188-F10 (1991)
- THORBURN, J. A. An Extreme Population II Dwarf without Lithium. *L. M. Hobbs, D. E. Welty, & J. A. Thorburn.* 373, L47, 97-B13 (1991)
- The Lithium Abundance in Extreme Halo Stars. *L. M. Hobbs & J. A. Thorburn.* 375, 116, 112-D8 (1991)
- THORNE, D. J. Multiwavelength Isophotal Data for Southern Elliptical Galaxies. *W. B. Sparks, J. V. Wall, P. R. Jorden, D. J. Thorne, & I. van Breda.* 76, 471, 31-F11 (1991)
- THORNTON, G. See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- THORSETT, S. E. Frequency Dependence of Pulsar Integrated Profiles. *S. E. Thorsett.* 377, 263, 141-C1 (1991)
- THORSTENSEN, JOHN R. The Binary Feige 24: The Mass, Radius, and Gravitational Redshift of the DA White Dwarf. *Stéphane Vennes, John R. Thorstensen, Peter Theill, & Harry L. Shipman.* 372, L37, 79-E5 (1991)
- THRONSON, H. A. See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- THRONSON, HARLEY A., JR. The Molecular Envelope of NGC 7027. *John H. Bieging, David Wilner, & Harley A. Thronson, Jr.* 379, 271, 166-D9 (1991)
- Near-Infrared [Fe II] Emission of M82 Supernova Remnants: Implications for Tracing the Supernova Content of Galaxies. *Matthew A. Greenhouse, Charles E. Woodward, Harley A. Thronson, Jr., Richard J. Rudy, George S. Rossano, Peter Erwin, & R. C. Puett.* 383, 164, 214-B1 (1991)
- THUAN, T. X. Compact Starbursts in Ultraluminous Infrared Galaxies. *J. J. Condon, Z.-P. Huang, Q. F. Yin, & T. X. Thuan.* 378, 65, 151-G5 (1991)
- THUAN, TRINH X. Northern Dwarf and Low Surface Brightness Galaxies. IV. The Large-Scale Space Distribution. *Trinh X. Thuan, Jean-Michel Alimi, J. Richard Gott III, & Stephen E. Schneider.* 370, 25, 47-D1 (1991)
- TICKOO, A. K. Possible Detection of TeV Gamma Rays from AM Herculis. *C. L. Bhat, R. K. Kaul, H. S. Rawat, V. K. Senecha, R. C. Rannat, M. L. Sapru, A. K. Tickoo, & H. Razdan.* 369, 475, 43-E12 (1991)
- TIELENS, A. G. G. M. The Interstellar C-H Stretching Band near 3.4 Microns: Constraints on the Composition of Organic Material in the Diffuse Interstellar Medium. *S. A. Sandford, L. J. Allamandola, A. G. G. M. Tielens, K. Sellgren, M. Tapia, & Y. Pendleton.* 371, 607, 69-B1 (1991)
- The Mid-Infrared Spectrum of the Carbon Star HD 38218 and Its Possible Relation to Polycyclic Aromatic Hydrocarbons. *Richard H. Buss, Jr., A. G. G. M. Tielens, & Theodore P. Snow.* 372, 281, 77-D8 (1991)
- Low-Density Photodissociation Regions. *David J. Hollenbach, Takemasa Takahashi, & A. G. G. M. Tielens.* 377, 192, 140-C11 (1991)
- Interstellar Solid CO: Polar and Nonpolar Interstellar Ices. *A. G. G. M. Tielens, A. T. Tokunaga, T. R. Geballe, & F. Baas.* 381, 181, 191-C5 (1991)
- 10 Micron Spectra of Protostars and the Solid Methanol Abundance. *W. A. Schutte, A. G. G. M. Tielens, & S. A. Sandford.* 382, 523, 208-A11 (1991)
- TIELENS, ALEXANDER G. G. M. Polycyclic Aromatic Hydrocarbon Optical Properties and Contribution to the Acceleration of Stellar Outflows. *Isabelle Cherchneff, John R. Barker, & Alexander G. M. Tielens.* 377, 541, 146-D6 (1991)
- TIFTI, W. G. Properties of the Redshift. II. Radial Variation. *W. G. Tifti.* 368, 105, 24-D1 (1991)
- Statistical Procedure and the Significance of Periodicities in Double-Galaxy Redshifts. *W. J. Cocke & W. G. Tifti.* 368, 383, 29-G6 (1991)

- Properties of the Redshift. III. Temporal Variation. *W. G. Tifft*. 382, 396, 206-E1 (1991)
- TILANUS, R. P. J. CO (3-2) Mapping and Gas Excitation in the Core of M82. *R. P. J. Tilanus, L. J. Tacconi, E. C. Sutton, S. Zhou, D. B. Sanders, C. G. Wynn-Williams, K. Y. Lo, & S. A. Stephens*. 376, 500, 132-E13 (1991)
- TINTO, MASSIMO. Coincidence Probabilities for Spacecraft Gravitational Wave Experiments: Massive Coalescing Binaries. *Massimo Tinto & J. W. Armstrong*. 372, 545, 82-E1 (1991)
- TITLE, A. M. Modeling Mesogranules and Exploders on the Solar Surface. *G. W. Simon, A. M. Title, & N. O. Weiss*. 375, 775, 122-C7 (1991)
- TOKUNAGA, A. T. A Sensitive Upper Limit on the Methane Abundance in Comet Levy (1990c). *T. Y. Brooke, A. T. Tokunaga, H. A. Weaver, G. Chin, & T. R. Geballe*. 372, L113, 85-G1 (1991)
- Trapped H<sub>2</sub>O in SiO Condensate: An Explanation for the 3 Micron Band Observed toward the Galactic Center. *S. Wada, A. Sakata, & A. T. Tokunaga*. 375, L17, 117-C1 (1991)
- High-Resolution Spectra of the 3.29 Micron Interstellar Emission Feature: A Summary. *A. T. Tokunaga, K. Sellgren, R. G. Smith, T. Nagata, A. Sakata, & Y. Nakada*. 380, 452, 183-G8 (1991)
- Interstellar Solid CO: Polar and Nonpolar Interstellar Ices. *A. G. G. M. Tielens, A. T. Tokunaga, T. R. Geballe, & F. Baas*. 381, 181, 191-C5 (1991)
- TOMISAKA, KOHJI. The Equilibria and Evolutions of Magnetized, Rotating, Isothermal Clouds. V. The Effect of the Toroidal Field. *Kohji Tomisaka*. 376, 190, 127-C11 (1991)
- TOMITA, KENJI. Correlation Function of Gravitational Deflection Angles of Light Paths. *Kazuya Watanabe & Kenji Tomita*. 370, 481, 54-D1 (1991)
- TOMLEY, LESLIE. On the Evolution of Gravitationally Unstable Protostellar Disks. *Leslie Tomley, Patrick Cassen, & Thomas Steiman-Cameron*. 382, 530, 208-B6 (1991)
- TONER, CLIFFORD G. Can the Starpatch on  $\xi$  Bootis Be Explained by Using Tangential Flows? *Clifford G. Toner & Barry J. LaBonte*. 368, 633, 33-A10 (1991)
- TONY, JOHN L. Southern Sky Redshift Survey: The Catalog. *L. Nicolaci da Costa, Paulo S. Pellegrini, Marc Davis, Avery Meiksin, Wallace L. W. Sargent, & John L. Tonry*. 75, 935, 15-B1 (1991)
- Surface Brightness Fluctuations: A Bridge from M31 to the Hubble Constant. *John L. Tonry*. 373, L1, 91-A8 (1991)
- Surface Brightness Fluctuations: A Bridge from M31 to the Hubble Constant: Erratum. *John L. Tonry*. 382, L109, 211-F9 (1991) (Orig. paper in 373, L1, 91-A8 (1991))
- TOOMRE, JURI. Nonlinear Behavior of Solar Gravity Modes Driven by <sup>3</sup>He in the Core. II. Numerical Simulations. *William J. Merryfield, Juri Toomre, & Douglas Gough*. 367, 658, 21-D8 (1991)
- Simulation of Effects of Atmospheric Seeing on the Observation of High-Degree Solar Oscillations. *Frank Hill, Douglas Gough, William J. Merryfield, & Juri Toomre*. 369, 237, 38-G7 (1991)
- Turbulent Compressible Convection. *Fausto Cattaneo, Nicholas H. Brummell, Juri Toomre, Andrea Malagoli, & Neal E. Hurlbut*. 370, 282, 50-F10 (1991)
- TORNAMBÈ, AMEDEO. He Stars and He-accreting CO White Dwarfs. *Marco Limongi & Amedeo Tornambè*. 371, 317, 64-A9 (1991)
- Advanced Evolutionary Phases of Large-Metallicity Low-Mass Stars and the Problem of the Ultraviolet Excess of Elliptical Galaxies. *Marco Castellani & Amedeo Tornambè*. 381, 393, 195-E9 (1991)
- TORRELLES, JOSÉ M. A Double Radio Source at the Center of the Outflow in L723. *Guillermo Anglada, Robert Estalella, Luis F. Rodriguez, José M. Torrelles, Rosario López, & Jorge Canto*. 376, 615, 134-A7 (1991)
- TORRES, S. See SMOOT, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- TOWNES, C. H. Distribution of Dust about  $\alpha$  Ceti and  $\alpha$  Orionis Based on 11 Micron Spatial Interferometry. *M. Bester, W. C. Danchi, C. G. DeGiacomi, C. H. Townes, & T. R. Geballe*. 367, L27, 17-E1 (1991)
- The 158 Micron [C II] Line: A Measure of Global Star Formation Activity in Galaxies. *G. J. Stacey, N. Geis, R. Genzel, J. B. Lugin, A. Poglitsch, A. Sternberg, & C. H. Townes*. 373, 423, 93-C1 (1991)
- A Survey of the 158 Micron [C II] Fine-Structure Line in the Central 50 Parsecs of The Galaxy. *A. Poglitsch, G. J. Stacey, N. Geis, M. Haggerty, J. Jackson, M. Rumitz, R. Genzel, & C. H. Townes*. 374, L33, 110-B5 (1991)
- The Optical Depth of the 158 Micron [<sup>12</sup>C II] Line: Detection of the  $F = 1 \rightarrow 0$  [<sup>13</sup>C II] Hyperfine-Structure Component. *G. J. Stacey, C. H. Townes, A. Poglitsch, S. C. Madden, J. M. Jackson, F. Herrmann, R. Genzel, & N. Geis*. 382, L37, 205-E1 (1991)
- TRAPTON, L. M. First Results from the Goddard High-Resolution Spectrograph: Resolved Velocity and Density Structure in the  $\beta$  Pictoris Circumstellar Gas. *A. Bogess, Frederick C. Bruhweiler, C. A. Grady, Dennis C. Ebbets, Yoji Kondo, L. M. Trapton, John C. Brandt, & S. R. Heap*. 377, L49, 143-F1 (1991)
- TRAN, T. KH. The Galactic Center Radio Source Shines below the Compton Limit. *C. R. Gwinn, R. M. Danen, J. Middleditch, L. M. Ozernoy, & T. Kh. Tran*. 381, L43, 199-B7 (1991)
- TRETYAKOVA, CH. A. See ADAMS, J. H., JR., et al. The Charge State of the Anomalous Component of Cosmic Rays.
- TREVES, A. Coordinated X-Ray, Ultraviolet, and Optical Observations of 3C 120. *L. Maraschi, L. Chiappetti, R. Falomo, B. Garilli, M. Malkan, G. Tagliaferri, E. G. Tanzi, & A. Treves*. 368, 138, 24-F9 (1991)
- X-Ray to Infrared Observations of the AM Herculis System E1405-451 (V834 Centauri). *R. M. Sambruna, L. Chiappetti, A. Treves, J. M. Bonnet-Bidaud, P. Bouchet, L. Maraschi, C. Motch, & M. Mouchez*. 374, 744, 108-C10 (1991)
- A Model for the Spectral Variability of BL Lacertae Objects at High Frequencies. *A. Celotti, L. Maraschi, & A. Treves*. 377, 403, 144-G1 (1991)
- Short-Term X-Ray Variability of the BL Lacertae Object PKS 2155-304: Power Spectrum and Cross-Correlation Analysis. *G. Tagliaferri, L. Stella, L. Maraschi, A. Treves, & A. Celotti*. 380, 78, 177-A5 (1991)
- On the Nebulosity Surrounding the BL Lacertae Object PKS 2155-304. *R. Falomo, E. Giraud, L. Maraschi, J. Melnick, E. G. Tanzi, & A. Treves*. 380, L67, 188-D1 (1991)
- See COWLEY, A. P., et al. Discovery of a Long-Term Periodic Variation in LMC X-3.
- TREVESE, D. Optical Variability of Quasars: Statistics and Cosmological Properties. *E. Giallongo, D. Trevese, & F. Vagnetti*. 377, 345, 144-B6 (1991)
- TRIBBLE, PETER C. Detection of Excess Rotation Measure Due to Intracenter Magnetic Fields in Clusters of Galaxies. *K.-T. Kim, Peter C. Tribble, & P. P. Kronberg*. 379, 80, 164-A5 (1991)
- TRINCHERO, G. See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- TRINCHIERI, G. Large-Scale Peculiar Velocity Fields in Superclusters of Galaxies. *G. Gavazzi, M. Scodellato, A. Boselli, & G. Trinchieri*. 382, 19, 200-C5 (1991)
- The Discrete X-Ray Source Population in M31. *G. Trinchieri & G. Fabiano*. 382, 82, 201-B6 (1991)
- TRIPP, T. M. Collisional Excitation and Radiative Properties of N II: The Strong Intercombination (<sup>1</sup>D-<sup>3</sup>P<sub>0</sub>) Transition at 748 Å. *T. M. Tripp, D. E. Shemansky, G. K. James, & J. M. Ajello*. 368, 641, 33-B6 (1991)
- TRUAX, RYLAND J. Model Atmospheres for Rotating B Stars. *George W. Collins II, Ryland J. Truax, & Steven R. Cranmer*. 77, 541, 52-B5 (1991)
- TRUONG, K. Q. See HUTCHINGS, J. B., et al. First Results from the Goddard High-Resolution Spectrograph: Ultraviolet Spectra of a Starburst Knot in NGC 1068.
- IUE Observations of NGC 1068: The Extremely Luminous Starburst Knots. *F. C. Bruhweiler, K. Q. Truong, & B. Aliner*. 379, 596, 172-B1 (1991)
- IUE Observations of NGC 1068: The Extended High-Ionization Emission Region. *K. Q. Truong & F. C. Bruhweiler*. 379, 609, 172-C1 (1991)
- TRURAN, JAMES W. See SAIZAR, PEDRO, et al. PW Vulpeculae: A Nova with Nearly Solar Abundances.
- The Common Envelope Phase in Classical Novae: One-dimensional Models. *Anurag Shankar, Mario Livio, & James W. Truran*. 374, 623, 106-G6 (1991)

- On the Formation of Globular Clusters. I. Dynamical Limits on Globular Cluster Metallicities.** *J. H. Brown, A. Burkert, & James W. Truran.* 376, 115, 126-D1 (1991)
- TSUNEMI, H.** See NAGASE, F., et al. **Cyclotron Line Features in the Spectrum of the Transient X-Ray Pulsar X0115+634.**
- TUCHMAN, Y.** **The Mode of Pulsation in Mira Variables Determined by the Observed Acceleration Data.** *Y. Tuchman.* 383, 779, 223-G11 (1991)
- TUELLER, J.** **GRIS Observations of  $^{26}\text{Al}$  Gamma-Ray Line Emission from Two Points in the Galactic Plane.** *B. J. Teegarden, S. D. Barthelmy, N. Gehrels, J. Tueller, M. Leventhal, & C. J. MacCallum.* 375, L9, 117-B4 (1991)
- GRIS Observations of Positron Annihilation Radiation from the Galactic Center.** *N. Gehrels, S. D. Barthelmy, B. J. Teegarden, J. Tueller, M. Leventhal, & C. J. MacCallum.* 375, L13, 117-B10 (1991)
- TULLY, J. A.** **A Critical Assessment of Electron Excitation between the  $2s^22p^2$  and  $2s2p^3$  Configurations of  $\text{Mg}^{+6}$ .** *A. Burgess, H. E. Mason, & J. A. Tully.* 376, 803, 136-D1 (1991)
- TULLY, R. BRENT.** **Ultramassive ( $\sim 10^{11} M_{\odot}$ ) Dark Core in the Luminous Infrared Galaxy NGC 6240?** *Jonathan Bland-Hawthorn, Andrew S. Wilson, & R. Brent Tully.* 371, L19, 66-C7 (1991)
- TULUIE, ROBIN.** **Anisotropies of the Cosmic Background Radiation in a "Hot" Dark Matter Universe.** *Peter Anninos, Richard A. Matzner, Robin Tului, & Joan Centrella.* 382, 71, 201-A1 (1991)
- TUOHY, I.** See GIOMMI, P., et al. **The EXOSAT High Galactic Latitude Survey.**
- TUOHY, I. R.** **The X-Ray Cooling Flow in the Cluster of Galaxies around PKS 2354-35.** *Daniel A. Schwartz, Hale V. Bradt, Ronald A. Remillard, & I. R. Tuohy.* 376, 424, 131-F6 (1991)
- TURCK-CHIÈZE, SYLVAINNE.** **A Critical Look at Cosmions.** *Jean Kaplan, François Marin de Volnay, Charling Tao, & Sylvaine Turck-Chièze.* 378, 315, 154-G11 (1991)
- TURNER, B. E.** **New OH Main-Line Detections of OH/IR Stars.** *Dale F. Dickinson & B. E. Turner.* 75, 1323, 23-A9 (1991)
- A Molecular Line Survey of Sagittarius B2 and Orion-KL from 70 to 115 GHz. II. Analysis of the Data.** *B. E. Turner.* 76, 617, 33-D1 (1991)
- Observations and Chemistry of Interstellar Refractory Elements.** *B. E. Turner.* 376, 573, 133-E1 (1991)
- Detection of Interstellar  $\text{H}_3\text{O}^+$ : A Confirming Line.** *Alwyn Wootten, J. G. Mangum, B. E. Turner, M. Boley, F. Boulanger, F. Combes, P. J. Encrason, & M. Gerin.* 380, L79, 188-E6 (1991)
- $\text{H}_2\text{CO}$  in IC 443G: Unusual Excitation and a Diagnostic of Shock Astrochemistry.** *B. E. Turner & D. A. Lubowich.* 381, 173, 191-B9 (1991)
- TURNER, EDWIN L.** **Gravitational Lensing and the Lyman-Alpha Forest.** *Satoru Ikeuchi & Edwin L. Turner.* 375, 499, 119-A5 (1991)
- The Evolution of the Diffuse Cosmic Ultraviolet Background Constrained by Hubble Space Telescope Observations of 3C 273.** *Satoru Ikeuchi & Edwin L. Turner.* 381, L1, 194-A9 (1991)
- TURNER, JEAN L.** **Hot Gas in the Nucleus of M82:  $^{12}\text{CO}$  and  $^{13}\text{CO}$   $J = 3-2$  Observations.** *Jean L. Turner, Robert N. Marin, & Paul T. P. Ho.* 367, 677, 21-F6 (1991) (Orig. paper in 351, 418, 45-C5 (1990))
- The Molecular Structure of a Starburst:  $^{13}\text{CO}$  in the Nucleus of Maffei 2.** *Robert L. Hurt & Jean L. Turner.* 377, 434, 145-B8 (1991)
- TURNER, M. J. L.** See Kil, T., et al. **X-Ray Continuum and Evidence for an Iron Emission Line from the Quasar E1821+643.**
- TURNER, MICHAEL S.** **Coherent Peculiar Velocities and Periodic Redshifts.** *Christopher T. Hill, Paul J. Steinhardt, & Michael S. Turner.* 366, L57, 11-B7 (1991)
- Microwave Distortions from Collapsing Domain-Wall Bubbles.** *Michael S. Turner, Richard Watkins, & Lawrence M. Widrow.* 367, L43, 22-B1 (1991)
- TURNER, T. J.** See PETERSON, B. M., et al. **Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.**
- Einstein Observatory SSS and MPC Observations of the Complex X-Ray Spectra of Seyfert Galaxies.** *T. J. Turner, K. A. Weaver, R. F. Mushotzky, S. S. Holt, & G. M. Madejski.* 381, 85, 190-B1 (1991)
- URNSHEK, D. A.** **A Radio-quiet Galaxy at Redshift  $z = 3.409$ .** *D. A. Turnshek, F. Macchetto, M. V. Bencke, C. Hazard, W. B. Sparks, & R. G. McMahon.* 382, 26, 200-D1 (1991)
- URNSHEK, DAVID A.** **The Redshift Distribution of Ly $\alpha$  Clouds and the Proximity Effect.** *Limin Lu, Arthur M. Wolfe, & David A. Turnshek.* 367, 19, 12-C5 (1991)
- A New Spectroscopic Survey for Damped Ly $\alpha$  Absorption Lines from High-Redshift Galaxies.** *Kenneth M. Lanzetta, Arthur M. Wolfe, David A. Turnshek, Limin Lu, Richard G. McMahon, & Cyril Hazard.* 77, 1, 43-B1 (1991)
- TUROK, N.** **A Hydrodynamic Approach to Cosmology: Texture-seeded Cold Dark Matter and Hot Dark Matter Cosmogony.** *R. Y. Cen, J. P. Ostriker, D. N. Spergel, & N. Turok.* 383, 1, 212-B1 (1991)
- TUROK, NEIL.** **The Formation of Galaxies and Quasars in a Texture-seeded Cold Dark Matter Cosmogony.** *Andrew K. Gooding, David N. Spergel, & Neil Turok.* 372, L5, 79-A13 (1991)
- Large-Scale Structure in a Texture-seeded Cold Dark Matter Cosmogony.** *Changbom Park, David N. Spergel, & Neil Turok.* 372, L53, 85-B5 (1991)
- TUROLA, ROBERTO.** **Spherical Accretion onto Black Holes: A Complete Analysis of Stationary Solutions.** *Luciano Nobili, Roberto Turola, & Luca Zampieri.* 383, 250, 215-C9 (1991)
- TUSKA, EVELYN.** **Solar Modulation of Cosmic Electrons: Evidence for Dynamic Regulation.** *Evelyn Tuska, Paul Evenson, & Peter Meyer.* 373, L27, 91-D1 (1991)
- TUTUKOV, ALEXANDER V.** **Helium Star Cataclysms.** *Icko Iben, Jr., & Alexander V. Tutukov.* 370, 615, 56-B5 (1991)
- TWEEDY, R. W.** See KEPLER, S. O., et al. **A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.**
- TYLER, G. L.** See KRISHER, T. P., et al. **Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of Voyager 2.**
- TYLKA, A. J.** See ADAMS, J. H., JR., et al. **The Charge State of the Anomalous Component of Cosmic Rays.**
- TYLKA, ALLAN J.** **The Charge State of the Anomalous Component: Results from the Trapped Ions in Space Experiment.** *James H. Adams, Jr., Lorraine P. Beahm, & Allan J. Tylka.* 377, 292, 141-E9 (1991)
- TYSON, J. A.** **The Clustering of Faint Galaxies.** *G. Efstathiou, G. Bernstein, N. Katz, J. A. Tyson, & P. Guhathakurta.* 380, L47, 188-B1 (1991)
- TYSON, NEIL D.** **Radial Velocity Distribution and Line Strengths of 33 Carbon Stars in the Galactic Bulge.** *Neil D. Tyson & R. Michael Rich.* 367, 547, 20-B6 (1991)
- UBACHUKWU, A. A.** **The Confinement and Cosmological Evolution of Extragalactic Radio Source Components.** *A. A. Ubachukwu, S. E. Okoye, & L. I. Onuora.* 383, 56, 212-F7 (1991)
- UBERTINI, P.** **"Superlow-State" Hard X-Ray Observation of Cygnus X-1.** *P. Ubertini, A. Bazzano, F. Perotti, E. Quadrini, A. Court, A. J. Dean, N. Dipper, R. Lewis, L. Bassani, & J. B. Stephen.* 366, 544, 9-G1 (1991)
- See BAZZANO, A., et al. Hard X-Rays from Coma Cluster Region: Erratum.**
- See PEROTTI, F., et al. Hard X-Ray Variability of NGC 4151. Low-Flux Hard X-Ray Observation of Cygnus X-1.** *P. Ubertini, A. Bazzano, C. La Padula, R. K. Manchanda, V. F. Polcaro, R. Staubert, E. Kendziorra, & F. Perotti.* 383, 263, 215-D9 (1991)
- UENO, M.** **Infrared Polarization Images of Star-forming Regions. I. The Ubiquity of Bipolar Structure.** *M. Tamura, Ian Gailey, R. R. Joyce, M. Ueno, H. Suto, & M. Sekiguchi.* 378, 611, 160-A1 (1991)
- UESAWA, F.** **Measurement of the Neutron Capture Rate of the  $^{12}\text{C}(n, \gamma)^{13}\text{C}$  Reaction at Stellar Energy.** *Y. Nagai, M. Igashira, K. Takeda, N. Mukai, S. Motoyama, F. Uesawa, H. Kitazawa, & T. Fukuda.* 372, 683, 84-B7 (1991)
- See NAGAI, Y., et al. Capture Rate of the  $^7\text{Li}(n, \gamma)^8\text{Li}$  Reaction by Prompt Gamma-Ray Detection.**
- UKITA, N.** **Abundances in Red Giant Stars: Nitrogen Isotopes in Carbon-rich Molecular Envelopes.** *P. G. Wannier, B.-G. Andersson, H. Olofsson, N. Ukita, & K. Young.* 380, 593, 185-E8 (1991)

- ULIVI, LORENZO. Pure Rotational Spectrum of Hydrogen Deuteride by Far-Infrared Fourier Transform Spectroscopy. *Lorenzo Ulivi, Paolo De Natale, & Massimo Inguscio.* 378, L29, 157-D7 (1991)
- ULMER, M. P. HEAO 3 Upper Limits to Pulsed Gamma-Ray Emission from PSR 1509-58 and PSR 0833-45. *M. P. Ulmer, W. R. Purcell, W. A. Wheaton, & W. A. Mahoney.* 369, 485, 43-F12 (1991)
- ULRICH, M.-H. The Ultraviolet Spectrum of NGC 4151 from 1978 to 1990: General Characteristics and Evolution. *M.-H. Ulrich, A. Boksenberg, G. E. Bromage, J. Clavel, A. Elvius, M. V. Penston, G. C. Perola, & M. A. J. Snijders.* 382, 483, 207-E7 (1991)
- UMEBAYASHI, TOYOHARU. Magnetic Flux Loss from Interstellar Clouds with Various Grain-Size Distributions. *Ryoichi Nishi, Takenori Nakano, & Toyoharu Umebayashi.* 368, 181, 25-C11 (1991)
- UMEMOTO, T. See KOYAMA, K., et al. An X-Ray Pulsator in the Direction of Molecular Cloud MBM 12 (Lynds 1457).
- UMEMOTO, TOMOFUMI. A Millimeter-Wave Line Study of L1287: A Case of Induced Star Formation by Stellar Wind Compression? *Ji Yang, Tomofumi Umemoto, Takahiro Iwata, & Yasuo Fukui.* 373, 137, 87-F7 (1991)
- U-shaped Outflow in the Lynds 1221 Dark Cloud: An Example of Interaction of Outflows with Ambient Molecular Clouds. *Tomofumi Umemoto, Naomi Hirano, Osamu Kameya, Yasuo Fukui, Nario Kuno, & Keiya Takakubo.* 377, 510, 146-A13 (1991)
- UNDERHILL, ANNE B. HD 50896: Blobs in a Wind with a Collapsed Companion or Rotating Disk with Central Filaments? *Anne B. Underhill & Stephenson Yang.* 368, 588, 32-D9 (1991)
- About the Stage of Evolution of Wolf-Rayet Stars. *Anne B. Underhill.* 383, 729, 223-C6 (1991)
- URRY, C. M. Fanaroff-Riley I Galaxies as the Parent Population of BL Lacertae Objects. II. Optical Constraints. *P. Padovani & C. M. Urry.* 368, 373, 29-F6 (1991)
- Altered Luminosity Functions for Relativistically Beamed Objects. II. Distribution of Lorentz Factors and Parent Populations with Complex Luminosity Functions. *C. M. Urry & P. Padovani.* 371, 60, 60-G5 (1991)
- The Effect of Anisotropic Emission from Thick Accretion Disks on the Luminosity Functions of Active Galactic Nuclei. *C. M. Urry, P. Marziani, & M. Calvani.* 371, 510, 67-G7 (1991)
- See EDELSON, R. A., et al. Rapid Ultraviolet Variability in the BL Lacertae Object PKS 2155-304.
- The Complete Sample of 1 Jansky BL Lacertae Objects. I. Summary Properties. *M. Stickel, P. Padovani, C. M. Urry, J. W. Fried, & H. Kühr.* 374, 431, 104-E1 (1991)
- Fanaroff-Riley I Galaxies as the Parent Population of BL Lacertae Objects. III. Radio Constraints. *C. M. Urry, P. Padovani, & M. Stickel.* 382, 501, 207-F13 (1991)
- URRY, C. MEGAN. Accretion Disk Emission from a BL Lacertae Object. *Amri Wandell & C. Megan Urry.* 367, 78, 13-A5 (1991)
- A Ubiquitous Absorption Feature in the X-Ray Spectra of BL Lacertae Objects. *Greg M. Madejski, Richard F. Mushotzky, Kimberly A. Weaver, Keith A. Arnaud, & C. Megan Urry.* 370, 198, 49-F1 (1991)
- USON, JUAN M. Large-Aperture BVRJK Photometry of Rich Abell Clusters: Constraints on Dark Matter. *Juan M. Usón & Stephen P. Boughn.* 369, 38, 36-D11 (1991)
- Diffuse Light in Dense Clusters of Galaxies. I. R-Band Observations of Abell 2029. *Juan M. Usón, Stephen P. Boughn, & Jeffrey R. Kuhn.* 369, 46, 36-E7 (1991)
- A Search for Redshifted Neutral Hydrogen from Protoclusters of Galaxies. *Juan M. Usón, Durgadas S. Bagri, & Timothy J. Cornwell.* 377, L65, 150-B1 (1991)
- VACANTI, G. See MACOMB, D. J., et al. Search for TeV Emission from 4U 0115+63.
- Gamma-Ray Observations of the Crab Nebula at TeV Energies. *G. Vacanti, M. F. Cawley, E. Colombo, D. J. Fegan, A. M. Hillas, P. W. Kwok, M. J. Lang, R. C. Lamb, D. A. Lewis, D. J. Macomb, K. S. O'Flaherty, P. T. Reynolds, & T. C. Weekes.* 377, 467, 145-E4 (1991)
- See REYNOLDS, P. T., et al. Search for TeV Gamma-Ray Emission from Hercules X-1.
- VADER, J. PATRICIA. The Small-Scale Clustering Properties of Dwarf Galaxies. *J. Patricia Vader & Allan Sandage.* 379, L1, 169-A8 (1991)
- VAECK, N. Accurate Oscillator Strengths of Astrophysical Interest for Neutral Oxygen. *E. Biémont, A. Hibbert, M. Godfroid, N. Vaeck, & B. C. Fawcett.* 375, 818, 122-G1 (1991)
- VAGNETTI, F. BL Lacertae Objects and Radio-loud Quasars within an Evolutionary Unified Scheme. *F. Vagnetti, E. Giallongo, & A. Cavaliere.* 368, 366, 29-E11 (1991)
- Optical Variability of Quasars: Statistics and Cosmological Properties. *E. Giallongo, D. Trevese, & F. Vagnetti.* 377, 345, 144-B6 (1991)
- VAHIA, M. N. X-Ray Luminosity and Spectral Variability in the Seyfert Type I Galaxy: PG 2130+099. *K. P. Singh, A. R. Rao, & M. N. Vahia.* 372, 49, 74-E13 (1991)
- Ionization States of the Anomalous Cosmic Rays. *R. K. Singh, Banashree Mitra, N. Durgaprasad, S. Biswas, M. N. Vahia, J. S. Yadav, A. Dutta, & J. N. Goswami.* 374, 753, 108-D7 (1991)
- X-Ray Observations of the Bright Seyfert Galaxy IC 4329A. *K. P. Singh, A. R. Rao, & M. N. Vahia.* 377, 417, 145-A1 (1991)
- VAIANA, G. S. The Diffuse Soft X-Ray Background As Seen with the Einstein Observatory. *G. Micela, F. R. Harnden, Jr., R. Rosner, S. Sciotino, & G. S. Vaiana.* 380, 495, 184-D1 (1991)
- VAINSSTEIN, SAMUEL I. On Turbulent Diffusion of Magnetic Fields and the Loss of Magnetic Flux from Stars. *Samuel I. Vainshtein & Robert Rosner.* 376, 199, 127-D7 (1991)
- Suppression of Turbulent Transport by a Weak Magnetic Field. *Fausto Cattaneo & Samuel I. Vainshtein.* 376, L21, 130-C6 (1991)
- VALLÉE, J. P. Reversing the Axisymmetric ( $n = 0$ ) Magnetic Fields in the Milky Way. *J. P. Vallée.* 366, 450, 8-D9 (1991)
- VALLERGA, J. V. Predicted Extreme-Ultraviolet Line Emission for Nearby Main-Sequence B Stars. *J. J. MacFarlane, J. P. Cassinelli, B. Y. Welsh, P. W. Vedder, J. V. Vallerga, & W. L. Waldron.* 380, 564, 185-C1 (1991)
- Further High-Resolution Na I Observations of the Local Interstellar Medium. *B. Y. Welsh, P. W. Vedder, J. V. Vallerga, & N. Craig.* 381, 462, 196-D7 (1991)
- VALLURI, MONICA. H I Deficiency in Cluster Spiral Galaxies: Dependence on Galaxy Size. *Monica Valluri & Chanda J. Jog.* 374, 103, 99-C7 (1991)
- VALTAOJA, E. See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- VAN ALTEA, WM. F. See FRANZ, O. G., et al. Binary Star Observations with the Hubble Space Telescope Fine Guidance Sensors. I. ADS 11300.
- VAN BREDA, I. Multiwavelength Isophotal Data for Southern Elliptical Galaxies. *W. B. Sparks, J. V. Wall, P. R. Jorden, D. J. Thorne, & I. van Brede.* 76, 471, 31-F11 (1991)
- VAN BREUGEL, WIL. Spatially Resolved Optical Images of High-Redshift Quasi-stellar Objects. *Timothy M. Heckman, Matthew D. Lehner, Wil van Breugel, & George K. Miley.* 370, 78, 48-A7 (1991)
- Correlated Radio and Optical Asymmetries in Powerful Radio Sources. *Patrick J. McCarthy, Wil van Breugel, & Vijay K. Kapahi.* 371, 478, 67-D11 (1991)
- Spectroscopy of Spatially Extended Material around High-Redshift Radio-loud Quasars. *Timothy M. Heckman, Matthew D. Lehner, George K. Miley, & Wil van Breugel.* 381, 373, 195-D1 (1991)
- VAN BUREN, DAVE. Bow Shock Models of Ultracompact H II Regions. *Mordocai-Mark Mac Low, Dave Van Buren, Douglas O. S. Wood, & Ed Churchwell.* 369, 395, 42-F1 (1991)
- VANCURA, O. See FELDMAN, P. D., et al. Observations of Comet Levy (1990c) with the Hopkins Ultraviolet Telescope.
- SEE MOOS, H. W., et al. Determination of Ionic Abundances in the Io Torus Using the Hopkins Ultraviolet Telescope.
- VANCURA, OLAF. A Detailed Optical Study of Kepler's Supernova Remnant. *William P. Blair, Knox S. Long, & Olaf Vancura.* 366, 484, 9-A1 (1991)
- Far-Ultraviolet Mapping of the Cygnus Loop with the Voyager 2 Ultraviolet Spectrometer. *William P. Blair, Knox S. Long, Olaf Vancura, & J. B. Holberg.* 374, 202, 100-E5 (1991)
- See BLAIR, WILLIAM P., et al. Discovery of a Fast Radiative Shock Wave in the Cygnus Loop Using the Hopkins Ultraviolet Telescope.
- See LONG, KNOX S., et al. Spectroscopy of Z Camelopardalis in Outburst with the Hopkins Ultraviolet Telescope.

- See FERGUSON, HENRY C., et al. Constraints on the Origin of the Ultraviolet Upturn in Elliptical Galaxies from Hopkins Ultraviolet Telescope Observations of NGC 1399.
- VAN DALEN, ANTHONY. Formation of Galactic Halos from Seeded Hot Dark Matter. *Anthony van Dalen & Jens Verner Villumsen*. 376, 371, 131-B1 (1991)
- VANDENBERG, DON A. Implications of Helium Diffusion for Globular Cluster Isochrones and Luminosity Functions. *Charles R. Profitt & Don A. Vandenberg*. 77, 473, 51-C10 (1991)
- VAN DEN BERGH, SIDNEY. Star Clusters in the Clouds of Magellan. *Sidney van den Bergh*. 369, 1, 36-A11 (1991)
- Supernova Rates and Galaxy Inclinations: Erratum. *Sidney van den Bergh & Robert D. McClure*. 371, 443, 65-F3 (1991) (Orig. paper in 359, 277, 139-D13 (1990))
- The Luminosity Distribution of Globular Clusters in Three Giant Virgo Ellipticals. *William E. Harris, J. W. B. Allwright, Christopher J. Prieto, & Sidney van den Bergh*. 76, 115, 25-D11 (1991)
- The Correlation Function of cD Clusters. *Michael J. West & Sidney van den Bergh*. 373, 1, 86-B1 (1991)
- Changes in the Optical Remnant of Kepler's Supernova during the Period 1942-1989. *Rino Bandiera & Sidney van den Bergh*. 374, 186, 100-C11 (1991)
- Diameters of Galactic Globular Clusters. *Sidney van den Bergh, Christopher Morley, & John Pashay*. 375, 594, 120-B1 (1991)
- VAN DER HUCHT, K. A. IRAS 17380-3031: A New Dusty Late WC-Type Wolf-Rayet Star. *Martin Cohen, K. A. van der Hucht, P. M. Williams, & P. S. Thé*. 378, 302, 154-F7 (1991)
- VAN DER KLIS, M. See TAN, J., et al. Changes in the 11 Minute Period of 4U 1820-30.
- See WOOD, K. S., et al. Searches for Millisecond Pulsations in Low-Mass X-Ray Binaries.
- VAN DER VELDE, J. C. See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- VANDERVOORT, PETER O. Modes of Oscillation of a Uniformly Rotating, Homogeneous Spheroid of Stars. *Peter O. Vandervoort*. 377, 49, 138-F1 (1991)
- On the Effects of Interstellar Gas on the Oscillations and the Stability of Galaxies. *Peter O. Vandervoort*. 383, 498, 220-E1 (1991)
- VAN DER WOERD, HANS. On the X-Ray-emitting Boundary Layer of the Dwarf Nova VW Hydri. *Christopher W. Mauche, Richard A. Wade, Ronald S. Polidan, Hans van der Woerd, & Frits B. S. Paerels*. 372, 659, 83-G7 (1991)
- VAN DISHOECK, EWINE F. Electron Densities and the Excitation of CN in Molecular Clouds. *John H. Black & Ewine F. van Dishoeck*. 369, L9, 40-B5 (1991)
- VAN DYK, SCHUYLER D. The 10 Year Radio Light Curves for SN 1979C. *Kurt W. Weiler, Schuyler D. Van Dyk, Nino Panagia, Richard A. Sramek, & Jennifer L. Discenna*. 380, 161, 178-B1 (1991)
- VAN DYKE DIXON, W. See BLAIR, WILLIAM P., et al. Discovery of a Fast Radiative Shock Wave in the Cygnus Loop Using the Hopkins Ultraviolet Telescope.
- VAN GORKOM, J. H. On the Population of H I Dwarf Galaxies. *David H. Weinberg, Arpad Szomoru, P. Guhathakurta, & J. H. van Gorkom*. 372, L13, 79-B11 (1991)
- VAN HORN, H. M. The Shear Modulus of the Neutron Star Crust and Nonradial Oscillations of Neutron Stars. *T. Strohmayer, S. Ogata, H. Iyetomi, S. Ichimaru, & H. M. Van Horn*. 375, 679, 121-B7 (1991)
- VAN PARADIJS, J. See TAN, J., et al. Changes in the 11 Minute Period of 4U 1820-30.
- See WOOD, K. S., et al. Searches for Millisecond Pulsations in Low-Mass X-Ray Binaries.
- VAN RIPER, KENNETH A. Neutron Star Thermal Evolution. *Kenneth A. Van Riper*. 75, 449, 6-G7 (1991)
- Steady State Energy Sources in Neutron Stars. *Kenneth A. Van Riper*. 372, 251, 77-A13 (1991)
- SN 1991I: Gamma-Ray Observatory's First Supernova? *Adam Burrows, Anurag Shankar, & Kenneth A. Van Riper*. 379, L7, 169-B1 (1991)
- Soft X-Ray Pulses from Neutron Star Glitches. *Kenneth A. Van Riper, Richard I. Epstein, & Guy S. Miller*. 381, L47, 199-C1 (1991)
- VAN STEENBERG, MICHAEL E. X-Ray Emission from Hybrid-Chromosphere Stars. *Alexander Brown, Stephen A. Drake*, *Michael E. Van Steenberg, & Jeffrey L. Linsky*. 373, 614, 95-E9 (1991)
- VANTURE, ANDREW D. Abundances of Te and Related Elements in Stars of Type M, MS, and S. *Andrew D. Vanture, Georg Wallerstein, Jeffery A. Brown, & Grant Bazzan*. 381, 278, 192-D7 (1991)
- VARMA, VIJAYA S. Recalculation of Radial Matrix Integrals for the Electric Dipole Transitions in Hydrogen. *G. P. Malik, Usha Malik, & Vijaya S. Varma*. 371, 418, 65-D1 (1991)
- On Solar Emission Lines. *G. P. Malik, L. K. Pande, & Vijaya S. Varma*. 379, 788, 174-E1 (1991)
- VASU, MARY. Continuum Opacity Produced by Spectral Lines in Supernovae and Similar Explosions. *Robert V. Waggoner, Christopher A. Perez, & Mary Vasu*. 377, 639, 147-E12 (1991)
- VAUCLAIR, G. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- Discovery and Seismological Interpretation of Low-Amplitude Modes in the Pulsating DO White Dwarf PG 1707+427 (V817 Herculis). *G. Fontaine, P. Bergeron, G. Vauchair, P. Brassard, E. Wesemael, S. D. Kawaler, A. D. Grauer, & D. E. Winget*. 378, L49, 162-F1 (1991)
- VAUGHAN, ARTHUR H. See DUNCAN, DOUGLAS K., et al. Ca II H and K Measurements Made at Mount Wilson Observatory, 1966-1983.
- VAUGHAN, B. A. See WOOD, K. S., et al. Searches for Millisecond Pulsations in Low-Mass X-Ray Binaries.
- VEDDER, P. W. Predicted Extreme-Ultraviolet Line Emission for Nearby Main-Sequence B Stars. *J. J. MacFarlane, J. P. Cassinelli, B. Y. Welsh, P. W. Vedder, J. V. Vallerga, & W. L. Waldron*. 380, 564, 185-C1 (1991)
- Further High-Resolution Na I Observations of the Local Interstellar Medium. *B. Y. Welsh, P. W. Vedder, J. V. Vallerga, & N. Craig*. 381, 462, 196-D7 (1991)
- VEDRENNE, G. See BOUCHET, L., et al. SIGMA Discovery of Variable  $e^+e^-$  Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7-2942.
- See SUNYAEV, R., et al. Three Spectral States of 1E 1740.7-2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature.
- VEILLEUX, S. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- VEILLEUX, SYLVAIN. A Study of the Structure and Kinematics of the Narrow-Line Region in Seyfert Galaxies. I. Atlas of Line Profiles. *Sylvain Veilleux*. 75, 357, 5-F1 (1991)
- A Study of the Structure and Kinematics of the Narrow-Line Region in Seyfert Galaxies. II. Analysis of the Line-Profile Parameters. *Sylvain Veilleux*. 75, 383, 6-A1 (1991)
- The Line-emitting Regions of the Exceptional Seyfert Galaxy Markarian 359. *Sylvain Veilleux*. 368, 158, 25-A9 (1991)
- A Study of the Structure and Kinematics of the Narrow-Line Region in Seyfert Galaxies. III. Individual Objects. *Sylvain Veilleux*. 369, 331, 42-A1 (1991)
- Unique Broad-Line Profile Variations in the Radio Galaxy 3C 390.3. *Sylvain Veilleux & Wei Zheng*. 377, 89, 139-B7 (1991)
- 3C 390.3: Modeling Variable Profile Humps. *Wei Zheng, Sylvain Veilleux, & Steven A. Grandi*. 381, 418, 196-A1 (1991)
- VENNES, STEPHANE. A Critical Analysis of the Ultraviolet Temperature Scale of the Helium-dominated DB and DBV White Dwarfs. *Peter Thejll, Stéphane Vennes, & Harry L. Shipman*. 370, 355, 51-F5 (1991)
- How Much Hydrogen Is There in a White Dwarf? *James MacDonald & Stéphane Vennes*. 371, 719, 70-E1 (1991)
- The Binary Feige 24: The Mass, Radius, and Gravitational Redshift of the DA White Dwarf. *Stéphane Vennes, John R. Thorstensen, Peter Thejll, & Harry L. Shipman*. 372, L37, 79-E5 (1991)
- Thermal X-Ray Emission from Classical Novae in Optical Decline. *James MacDonald & Stéphane Vennes*. 373, L51, 97-C4 (1991)
- VENTURINO, C. Diffuse Galactic Emission at Millimetric Wavelengths. *P. Andreani, G. Dall'Orlano, L. Martinis, L. Piccirillo, L. Pizzo, L. Rossi, & C. Venturino*. 375, 148, 112-G5 (1991)

- VORBUNT, F. Observations of Scorpius X-1 with IUE: Ultraviolet Results from a Multiwavelength Campaign. *S. D. Vrilek, W. Penninx, J. C. Raymond, F. Verbunt, P. Hertz, K. Wood, W. H. G. Lewin, & K. Mitsuda.* 376, 278, 128-D1 (1991)
- VERMA, RITU. Force-free Magnetic Fields: Generating Functions and Footpoint Displacements. *Richard Wolfson & Ritu Verma.* 375, 254, 114-B7 (1991)
- VERNETTO, S. See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- VERTER, FRANCES. The CO Luminosity Function of Galaxies. *Frances Verter.* 375, 95, 112-B11 (1991)
- VEttOLANI, GIAMPAOLO. The Distribution of Clusters of Galaxies within 300 Mpc  $h^{-1}$  and the Crossover to an Isotropic and Homogeneous Universe. *Roberto Scaramella, Giampaolo Vettolani, & Giovanni Zamorani.* 376, L1, 130-A7 (1991)
- VIDLAD-MADIAR, A. Studies of H I and D I in the Local Interstellar Medium. Erratum. *J. Murthy, R. C. Henry, H. W. Moos, A. Vidal-Madjar, J. L. Linsky, & C. Gry.* 378, 455, 156-E8 (1991) (Orig. paper in 356, 223, 191-G5 (1990))
- VIEGAS, S. M. The Origin of the Quasi-stellar Object Absorption Lines. *S. M. Viegas & R. B. Gruenwald.* 377, 39, 138-E5 (1991)
- VIEGAS, SUEL M. The Bumps in the Spectral Energy Distribution of Active Galactic Nuclei. *Marcella Contini & Sueli M. Viegas.* 373, 405, 93-A9 (1991)
- VITRI, M. Is the Standard Elliptical NGC 3379 a Triaxial Disk Galaxy? *M. Capaccioli, M. Vietri, E. V. Held, & H. Lorenz.* 371, 535, 68-B12 (1991)
- Triaxiality in Disk Galaxies. *F. Bertola, M. Vietri, & W. W. Zeilinger.* 374, L13, 103-D1 (1991)
- VILHU, OSMI. IUE Observations of Solar-Type Stars in the Pleiades and the Hyades. *Jean-Pierre Caillault, Osmi Vilhu, & Jeffrey L. Linsky.* 383, 594, 221-F1 (1991)
- VILLUMSEN, JENS V. Seeded Hot Dark Matter Models for Large-Scale Structure. *Jens V. Villumsen, Robert J. Scherrer, & Edmund Bertschinger.* 367, 37, 12-D11 (1991)
- Filamentary Superclustering in a Universe Dominated by Cold Dark Matter. *Michael J. West, Jens V. Villumsen, & Avishai Dekel.* 369, 287, 41-C7 (1991)
- Seeded Hot Dark Matter Models for Large-Scale Structure: Erratum. *Jens V. Villumsen, Robert J. Scherrer, & Edmund Bertschinger.* 381, 601, 198-C1 (1991) (Orig. paper in 367, 37, 12-D11 (1991))
- VILLUMSEN, JENS VERNER. Formation of Galactic Halos from Seeded Hot Dark Matter. *Anthony van Dalen & Jens Verner Villumsen.* 376, 371, 131-B1 (1991)
- VINCENT, JAMES M. The Chromospheric Activity of Low-Mass Stars in the Hyades. *John R. Stauffer, Mark S. Giampapa, William Herbst, James M. Vincent, Lee W. Hartmann, & Robert A. Stern.* 374, 142, 99-G1 (1991)
- VIO, R. 3C 345: Is the Variability of Quasars Nonlinear? *R. Vio, S. Cristiani, O. Lessi, & L. Salvadori.* 380, 351, 182-F1 (1991)
- VIRAG, ALOIS.  $^{26}\text{Al}$  and  $^{16}\text{O}$  in the Early Solar System: Clues from Meteoritic  $\text{Al}_2\text{O}_3$ . *Edward Anders, Alois Virág, Ernst Zinner, & Roy S. Lewis.* 373, L77, 97-F6 (1991)
- VISHNIAC, ETHAN T. Expansion-cooled Lyman-Alpha Clouds. *Robert C. Duncan, Ethan T. Vishniac, & Jeremiah P. Ostriker.* 368, L1, 28-B1 (1991)
- The Dynamic Instability of Adiabatic Blast Waves. *Dongsu Ryu & Ethan T. Vishniac.* 368, 411, 30-B12 (1991)
- Are Hypernovae Detectable? *Seok Jae Park & Ethan T. Vishniac.* 375, 565, 119-F9 (1991)
- Gauge-invariant Joining Conditions for Cosmological Perturbations. *Jai-chan Hwang & Ethan T. Vishniac.* 382, 363, 206-B1 (1991)
- Gravitational Instabilities in a Proto-Planetary Disk. *Hyerim Noh, Ethan T. Vishniac, & William D. Cochran.* 383, 372, 217-A1 (1991)
- VISHWANATH, P. R. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- VITELLO, PETER. A Theory of Gamma-Ray Bursts Based on Resonant Compton Scattering. *Peter Vitello & Charles D. Dermer.* 374, 668, 107-D1 (1991)
- VITTORIO, NICOLA. Limits on Cold Dark Matter Cosmologies from New Anisotropy Bounds on the Cosmic Microwave Background. *Nicola Vittorio, Peter Meinhold, Pio Francesco Muciaccia, Philip Lubin, & Joseph Silk.* 372, L1, 79-A7 (1991)
- Non-Gaussian Temperature Fluctuations in the Cosmic Microwave Background Sky from a Random Gaussian Density Field. *Roberto Scaramella & Nicola Vittorio.* 375, 439, 118-C1 (1991)
- Cosmic Microwave Background and Galactic Quadrupoles in the Millimeter Region. *Paolo de Bernardis, Silvia Masi, & Nicola Vittorio.* 382, 515, 208-A1 (1991)
- VLADILLO, GIOVANNI. The Local Interstellar Medium toward the Center of Loop I. *Miriam Centurion & Giovanni Vladilo.* 372, 494, 82-A1 (1991)
- VOEHL, S. A. See HEAP, S. R., et al. First Results from the Goddard High-Resolution Spectrograph: Spectroscopic Determination of Stellar Parameters of Melnick 42, an O3I Star in the Large Magellanic Cloud.
- VOEGEL, MANFRED. Non-LTE Analysis of the Ospe/WN9 Star HDE 269227 (R84). *Werner Schmutz, Claus Leitherer, Ivan Hubeny, Manfred Vogel, Wolf-Rainer Hamann, & Ulf Wesselowski.* 372, 664, 84-A1 (1991)
- VOGELEY, MICHAEL S. Void Statistics of the CfA Redshift Survey. *Michael S. Vogeley, Margaret J. Geller, & John P. Huchra.* 382, 44, 200-E12 (1991)
- VOIT, G. MARK. Energy Deposition by X-Ray Photoelectrons into Interstellar Molecular Clouds. *G. Mark Voit.* 377, 158, 140-A1 (1991)
- X-Ray Irradiation of Interstellar Grains in Active Galaxies: Evaporation and Infrared Spectra. *G. Mark Voit.* 379, 122, 164-E1 (1991)
- A Photoionization Model for the Optical Line Emission from Cooling Flows. *Megan Donahue & G. Mark Voit.* 381, 361, 195-C1 (1991)
- VOLK, KEVIN. New Low-Resolution Spectrometer Spectra for IRAS Sources. *Kevin Volk, Sun Kwok, R. E. Stencel, & E. Brugel.* 77, 607, 53-A1 (1991)
- VON BALLMOOS, P. On the Distribution of the Diffuse Galactic Gamma-Ray Line Emissions at 1809 keV and 511 keV. *P. von Ballmoos.* 380, 98, 177-C1 (1991)
- VON ROSENVINGE, T. T. Solar Particle Abundances at Energies Greater than 1 MeV per Nucleon and the Role of Interplanetary Shocks. *H. V. Cane, D. V. Reames, & T. T. von Rosenvinge.* 373, 675, 96-D1 (1991)
- VOSS, F. A Measurement of the  $^{22}\text{Ne}(\text{n}, \gamma)^{23}\text{Ne}$  Capture Cross Section at a Stellar Temperature of  $kT = 25$  keV. *Hermann Beer, G. Rupp, F. Voss, & F. Käppeler.* 379, 420, 168-C1 (1991)
- VRTILEK, J. M. The Millimeter-Wave Spectrum of Highly vibrationally Excited SiO. *R. Mollaaghataba, C. A. Gottlieb, J. M. Vrtilek, & P. Thaddeus.* 368, L19, 28-D1 (1991)
- Astronomical Detection of  $\text{H}_2\text{CCC}$ . *J. Cernicharo, C. A. Gottlieb, M. Guélin, T. C. Killian, G. Paubert, P. Thaddeus, & J. M. Vrtilek.* 368, L39, 35-C7 (1991)
- Astronomical Detection of  $\text{H}_2\text{CCCC}$ . *J. Cernicharo, C. A. Gottlieb, M. Guélin, T. C. Killian, P. Thaddeus, & J. M. Vrtilek.* 368, L43, 35-C11 (1991)
- VRTILEK, S. D. The Ultraviolet Spectrum of Scorpius X-1 as Observed by IUE: 1978-1988. *T. R. Kallman, J. C. Raymond, & S. D. Vrtilek.* 370, 717, 57-C1 (1991)
- Observations of Scorpius X-1 with IUE: Ultraviolet Results from a Multiwavelength Campaign. *S. D. Vrtilek, W. Penninx, J. C. Raymond, F. Verbunt, P. Hertz, K. Wood, W. H. G. Lewin, & K. Mitsuda.* 376, 278, 128-D1 (1991)
- The Einstein Objective Grating Spectrometer Survey of Galactic Binary X-Ray Sources. *S. D. Vrtilek, J. E. McClintock, F. D. Seward, S. M. Kahn, & B. J. Wargelin.* 76, 1127, 41-C1 (1991)
- WAAGEN, ELIZABETH O. The Interoutburst Behavior of Cataclysmic Variables. *Paula Szkody, Janet A. Mattei, Elizabeth O. Waagen, & Clay Stablein.* 76, 359, 29-E1 (1991)
- WADA, S. Trapped  $\text{H}_2\text{O}$  in SiO Condensate: An Explanation for the 3 Micron Band Observed toward the Galactic Center. *S. Wada, A. Sakata, & A. T. Tokunaga.* 375, L17, 117-C1 (1991)
- WADE, R. Mapping of Infrared Helium and Hydrogen Line Profiles in the Central Few Arcseconds of the Galaxy. *T. R. Geballe, K. Krisjunas, J. A. Bailey, & R. Wade.* 370, L73, 59-C8 (1991)
- WADE, RICHARD A. On the X-Ray-emitting Boundary Layer of the Dwarf Nova VW Hydry. *Christopher W. Mauche, Richard A. Wade,*

- Ronald S. Polidan, Hans van der Woerd, & Frits B. S. Paerels. 372, 659, 83-G7 (1991)
- Limits on the Space Density of Double Degenerates as Type Ia Supernova Progenitors. Diana Foss, Richard A. Wade, & Richard F. Green. 374, 281, 101-E9 (1991)
- WAGNER, R. M. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- Ultraviolet and Optical Spectroscopy of the R Aquarii Symmetrical Jet. J. M. Hollis, R. J. Oliversen, M. Kafatos, A. G. Michalitsianos, & R. M. Wagner. 377, 227, 140-F1 (1991)
- WAGNER, R. MARK. See SAIZAR, PEDRO, et al. PW Vulpeculae: A Nova with Nearly Solar Abundances.
- Optical Identification of the X-Ray Source GS 2023+338 as V404 Cygni. R. Mark Wagner, Sumner G. Starrfield, Steve B. Howell, Tobias J. Kreidl, S. J. Bus, A. Cassatella, R. Bertram, & R. Fried. 378, 293, 154-E10 (1991)
- WAGNER, S. See QUIRRENBACH, A., et al. Correlated Radio and Optical Variability in the BL Lacertae Object 0716+714.
- WAGONER, ROBERT V. Continuum Opacity Produced by Spectral Lines in Supernovae and Similar Explosions. Robert V. Wagoner, Christopher A. Perez, & Mary Vasu. 377, 639, 147-E12 (1991)
- Diskoseismology: Probing Accretion Disks. I. Trapped Adiabatic Oscillations. Michael A. Nowak & Robert V. Wagoner. 378, 656, 160-E9 (1991)
- WAHLGREEN, GLENN M. First Results from the Goddard High-Resolution Spectrograph: High-Resolution Observations of the 1942 Å Resonance Line of Hg II in the Chemically Peculiar B Star, x Lupi. David S. Leckrone, Glenn M. Wahlgren, & Sveneric G. Johansson. 377, L37, 143-E1 (1991)
- First Results from the Goddard High-Resolution Spectrograph: A Demonstration of Spectral Resolution and Experiments with Deconvolution. Glenn M. Wahlgren, David S. Leckrone, Steven N. Shore, Don J. Lindler, Ronald L. Gilliland, & Dennis C. Ebbets. 377, L41, 143-E6 (1991)
- First Results from the Goddard High-Resolution Spectrograph: The Chromosphere of  $\alpha$  Tauri. Kenneth G. Carpenter, Richard D. Robinson, Glenn M. Wahlgren, Thomas B. Ake, Dennis C. Ebbets, Jeffrey L. Linsky, Alexander Brown, & Frederick M. Walter. 377, L45, 143-E11 (1991)
- WALDRON, W. L. Predicted Extreme-Ultraviolet Line Emission for Nearby Main-Sequence B Stars. J. J. MacFarlane, J. P. Cassinelli, B. Y. Welsh, P. W. Vedder, J. V. Vallerga, & W. L. Waldron. 380, 564, 185-C1 (1991)
- WALDRON, WAYNE L. Direct Evidence for Stellar Wind X-Ray Absorption in O Stars. Wayne L. Waldron. 382, 603, 209-A9 (1991)
- WALKER, ALISTAIR R. The Metallicity of RR Lyrae Stars in Baade's Window. Alistair R. Walker & Donald M. Terndrup. 378, 119, 152-D13 (1991)
- WALKER, C. K. The Edges of Molecular Clouds: Fractal Boundaries and Density Structure. E. Falgarone, T. G. Phillips, & C. K. Walker. 378, 186, 153-C8 (1991)
- WALKER, TERRY P. Primordial Nucleosynthesis Redux. Terry P. Walker, Gary Steigman, David N. Schramm, Keith A. Olive, & Ho-Shik Kang. 376, 51, 125-F1 (1991)
- The Upper Bound to the Primordial Abundance of Helium and the Consistency of the Hot Big Bang Model. Keith A. Olive, Gary Steigman, & Terry P. Walker. 380, L1, 181-B1 (1991)
- WALL, J. V. Multiwavelength Isophotal Data for Southern Elliptical Galaxies. W. B. Sparks, J. V. Wall, P. R. Jorden, D. J. Thorne, & I. van Breda. 76, 471, 31-F11 (1991)
- WALL, W. F. Molecular Gas Excitation in NGC 253. W. F. Wall, D. T. Jaffe, F. P. Israel, & F. N. Bash. 380, 384, 183-A11 (1991)
- WALLER, WILLIAM. Two Micron Morphology of Candidate Protostars. Motohide Tamura, Ian Gatley, William Waller, & Michael W. Werner. 374, L25, 103-E7 (1991)
- WALLER, WILLIAM H. Relics of an Eruptive Starburst in NGC 1569. William H. Waller. 370, 144, 48-G12 (1991)
- WALLERSTEIN, G. Variable Interstellar Absorption toward HD 72127A. II. 1981-1988. L. M. Hobbs, R. Ferlet, D. E. Welty, & G. Wallerstein. 378, 586, 159-F1 (1991)
- WALLERSTEIN, GEORGE. Abundances of Tc and Related Elements in Stars of Type M, MS, and S. Andrew D. Vanure, George Wallerstein, Jeffery A. Brown, & Grant Bazar. 381, 278, 192-D7 (1991)
- Evidence for a Thermally Unstable Shock Wave in the Vela Supernova Remnant. John C. Raymond, George Wallerstein, & Bruce Balick. 383, 226, 214-G5 (1991)
- WALMSLEY, C. MALCOLM. VLBI Observations of Interstellar Ammonia Masers. Preethi Pratap, Karl M. Menten, Mark J. Reid, James M. Moran, & C. Malcolm Walmsley. 373, L13, 91-B12 (1991)
- WALSH, W. See MOULD, J. R., et al. The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. I. Southern Clusters.
- WALTER, FREDERICK M. Star Formation in Taurus-Auriga: The High-Mass Stars. Frederick M. Walter & William T. Boyd. 370, 318, 51-C1 (1991)
- First Results from the Goddard High-Resolution Spectrograph: The Chromosphere of  $\alpha$  Tauri. Kenneth G. Carpenter, Richard D. Robinson, Glenn M. Wahlgren, Thomas B. Ake, Dennis C. Ebbets, Jeffrey L. Linsky, Alexander Brown, & Frederick M. Walter. 377, L45, 143-E11 (1991)
- WALTERS, H. R. J. Collisional Rates and Cooling within Atomic Hydrogen Plasmas. T. T. Scholz & H. R. J. Walters. 380, 302, 180-A5 (1991)
- WALTHER, D. M. Two Micron Spectroscopy of Infrared Sources in NGC 2071. D. M. Walther, T. R. Geballe, & E. I. Robson. 377, 246, 141-A9 (1991)
- WALTMAN, E. B. Daily Observations of Compact Radio Sources at 2.7 and 8.1 GHz: 1979-1987. E. B. Waltman, R. L. Fiedler, K. J. Johnston, J. H. Spencer, D. R. Florkowski, F. J. Josties, D. D. McCarthy, & D. N. Matsakis. 77, 379, 49-G5 (1991)
- WALTON, S. R. Weak Magnetic Fields and Solar Irradiance Variations. J. K. Lawrence, G. A. Chapman, & S. R. Walton. 375, 771, 122-C1 (1991)
- WAMPLER, E. JOSEPH. A Study of Two Absorption-Line Complexes in the Quasar UM 402  $\equiv$  Q0207-003. E. Joseph Wampler. 368, 40, 23-E11 (1991)
- WAMSTEKER, WILLEM. Probing the Galactic Halo along the 3C 273 Sight Line Using IUE. Geoffrey S. Burks, Donald G. York, J. Chris Blades, Ralph C. Bohlin, & Willem Wamsteker. 381, 55, 189-F5 (1991)
- WANDEL, AMRI. Accretion Disk Emission from a BL Lacertae Object. Amri Wandell & C. Megan Urry. 367, 78, 13-A5 (1991)
- Evolution of the Luminosity Function of Quasar Accretion Disks. David M. Cadiz, Vahé Petrosian, & Amri Wandell. 372, L63, 85-C1 (1991)
- Luminosity Limit for Alpha-Viscosity Accretion Disks. Edison P. Liang & Amri Wandell. 376, 746, 135-E8 (1991)
- Hybrid Accretion Disks in Active Galactic Nuclei. I. Structure and Spectra. Amri Wandell & Edison P. Liang. 380, 84, 177-B1 (1991)
- WANG, BOQI. Time Evolution of Interstellar Dust and Far-Infrared Luminosity of Disk Galaxies. Boqi Wang. 374, 456, 104-G1 (1991)
- Integrated Far-Infrared Background from Galaxies. Boqi Wang. 374, 465, 104-G12 (1991)
- Effects of Internal Absorption on Galaxy Number Count and Redshift Distribution. Boqi Wang. 383, L37, 226-B6 (1991)
- WANG, HAIMIN. Motions, Fields, and Flares in the 1989 March Active Region. Haimin Wang, Frances Tang, Harold Zirin, & Guoxiang Ai. 380, 282, 179-E1 (1991)
- WANG, Q. An X-Ray Image of the Violent Interstellar Medium in 30 Doradus. Q. Wang & D. J. Helfand. 370, 541, 55-B9 (1991)
- The Detection of X-Ray Emission from the OB Associations of the Large Magellanic Cloud. Q. Wang & D. J. Helfand. 373, 497, 94-B7 (1991)
- The Detection of X-Rays from the Hot Interstellar Medium of the Large Magellanic Cloud. Q. Wang, T. Hamilton, D. J. Helfand, & X. Wu. 374, 475, 105-A10 (1991)
- The Intensity and Spectrum of the Diffuse X-Ray Background. X. Wu, T. Hamilton, D. J. Helfand, & Q. Wang. 379, 564, 171-F1 (1991)
- WANG, QINGDE. The Detection of the Hot Gaseous Halo around the Small Magellanic Cloud. Qingde Wang. 377, L85, 150-D1 (1991)
- LMC-2 as the Blowout of a Hot Superbubble. Qingde Wang & David J. Helfand. 379, 327, 167-B5 (1991)

- WANG, RUYOU. Spectroscopic Binaries in the Orion Nebula Cluster. *Heinrich A. Abt, Ruyou Wang, & Octavio Cardona.* 367, 155, 14-A1 (1991)
- WANG, XIOGANG. Current Sheet Formation and Rapid Reconnection in the Solar Corona. *A. Bhattacharjee & Xiogang Wang.* 372, 321, 78-A1 (1991)
- WANG, Y.-M. Why Fast Solar Wind Originates from Slowly Expanding Coronal Flux Tubes. *Y.-M. Wang & N. R. Sheeley, Jr.* 372, L45, 79-F1 (1991)
- Magnetic Flux Transport and the Sun's Dipole Moment: New Twists to the Babcock-Leighton Model. *Y.-M. Wang & N. R. Sheeley, Jr.* 375, 761, 122-B5 (1991)
- A New Solar Cycle Model Including Meridional Circulation. *Y.-M. Wang, N. R. Sheeley, Jr., & A. G. Nash.* 383, 431, 217-F1 (1991)
- WANG, Z. Millimeter Interferometer Observations of Infrared Luminous Galaxies: NGC 828 and NGC 6240. *Z. Wang, N. Z. Scoville, & D. B. Sanders.* 368, 112, 24-D9 (1991)
- WANG, ZHONG. Detection of Local Interstellar CO Absorption toward BL Lacertae. *Alan P. Marscher, Thomas M. Bania, & Zhong Wang.* 371, L77, 73-D7 (1991)
- WANNIER, P. G. A Second Outflow from L1551/IRS 5? *G. H. Moriarty-Schieven & P. G. Wannier.* 373, L23, 91-C8 (1991)
- Water in Dense Molecular Clouds. *P. G. Wannier, L. Pagani, T. B. H. Kuiper, M. A. Frerking, S. Gulkis, P. Encrernaz, H. M. Pickett, A. Leacheux, & W. J. Wilson.* 377, 171, 140-B1 (1991)
- Abundances in Red Giant Stars: Nitrogen Isotopes in Carbon-rich Molecular Envelopes. *P. G. Wannier, B-G Andersson, H. Olofsson, N. Ukita, & K. Young.* 380, 593, 185-E8 (1991)
- WANNIER, PETER G. Warm Neutral Halos around Molecular Clouds. III. Interpretation of H I and CO J = 1-0 Data. *B-G Andersson, Peter G. Wannier, & Mark Morris.* 366, 464, 8-F1 (1991)
- Warm Neutral Halos around Molecular Clouds. II. H I and CO (J = 1-0) Observations. *Peter G. Wannier, B-G Andersson, Mark Morris, & Steven M. Lichten.* 75, 987, 16-B1 (1991)
- WARD, M. J. The Featureless Continua and Hydrogen Lines of Seyfert 2 Galaxies. *A. L. Kinney, R. R. J. Antonucci, M. J. Ward, A. S. Wilson, & M. Whittle.* 377, 100, 139-C5 (1991)
- The Starburst Ring around the Seyfert Nucleus in NGC 7469. *A. S. Wilson, T. T. Helfer, C. A. Haniff, & M. J. Ward.* 381, 79, 190-A6 (1991)
- See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- WARD, MARTIN J. High-Excitation Extranuclear Gas in Seyfert Galaxies. *Christopher A. Haniff, Martin J. Ward, & Andrew S. Wilson.* 368, 167, 25-B5 (1991)
- Infrared Hot Spots in the Nucleus of NGC 253. *Duncan A. Forbes, Martin J. Ward, & D. L. DePoy.* 380, L63, 188-C6 (1991)
- Infrared Spectroscopy of Cygnus A: Implications for the Obscured Active Nucleus. *Martin J. Ward, Philip R. Blanco, Andrew S. Wilson, & Minoru Nishida.* 382, 115, 201-E11 (1991)
- WARDELL, LAURI L. Dust and Molecular Properties of the Low-Opacity Cloud Lynds 1563. *Frank O. Clark, R. J. Laureijis, & Lauri L. Wardell.* 370, 237, 50-B7 (1991)
- WARGELIN, B. J. The Einstein Objective Grating Spectrometer Survey of Galactic Binary X-Ray Sources. *S. D. Vrilek, J. E. McClintock, F. D. Seward, S. M. Kahn, & B. J. Wargelin.* 76, 1127, 41-C1 (1991)
- WARNER, B. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- WARREN, STEPHEN J. A Wide-Field Multicolor Survey for High-Redshift Quasars,  $z \geq 2.2$ . I. Photometric Catalog and Survey Selection Function. *Stephen J. Warren, Paul C. Hewett, Michael J. Irwin, & Patrick S. Osmer.* 76, 1, 24-B1 (1991)
- A Wide-Field Multicolor Survey for High-Redshift Quasars,  $z \geq 2.2$ . II. The Quasar Catalog. *Stephen J. Warren, Paul C. Hewett, & Patrick S. Osmer.* 76, 23, 24-D3 (1991)
- WARWICK, R. S. See EDELSON, R. A., et al. Rapid Ultraviolet Variability in the BL Lacertae Object PKS 2155-304.
- WASSERMAN, I. A Relativistic Model of Pulsar Polarization. *M. Blaskiewicz, J. M. Cordes, & I. Wasserman.* 370, 643, 56-D9 (1991)
- WASSERMAN, IRA. Synchrotron Radiation with Radiation Reaction. *Robert W. Nelson & Ira Wasserman.* 371, 265, 63-D7 (1991)
- Wide Binaries in the Woolley Catalog. *Ira Wasserman & Martin D. Weinberg.* 382, 149, 202-A12 (1991)
- WASSERMAN, L. W. See FRANZ, O. G., et al. Binary Star Observations with the *Hubble Space Telescope* Fine Guidance Sensors. I. ADS 11300.
- WATANABE, KAZUYA. Correlation Function of Gravitational Deflection Angles of Light Paths. *Kazuya Watanabe & Kenji Tomita.* 370, 481, 54-D1 (1991)
- WATKINS, RICHARD. Microwave Distortions from Collapsing Domain-Wall Bubbles. *Michael S. Turner, Richard Watkins, & Lawrence M. Widrow.* 367, L43, 22-B1 (1991)
- WATSON, WILLIAM D. Spectral Line Profiles and Luminosities of Astrophysical Water Masers. *Gerald E. Nedoluha & William D. Watson.* 367, L63, 22-C11 (1991)
- WATT, M. P. The Distribution of Dark Matter in the Perseus Cluster. *C. J. Eyles, M. P. Watt, D. Bertram, M. J. Church, T. J. Ponman, G. K. Skinner, & A. P. Willmore.* 376, 23, 125-C12 (1991)
- WDOWIAK, THOMAS J. On the State of the Emitter of the 3.3 Micron Unidentified Infrared Band: Absorption Spectroscopy of Polycyclic Aromatic Hydrocarbon Species. *Gregory C. Flickinger, Thomas J. Wdowiak, & Percy L. Gómez.* 380, L43, 181-F1 (1991)
- WEATHERALL, JAMES C. Coherent Radiation from Energetic Electron Streams via Collisionless Bremsstrahlung in Strong Plasma Turbulence. *James C. Weatherall & Gregory Benford.* 378, 543, 159-B8 (1991)
- WEAVER, H. A. A Sensitive Upper Limit on the Methane Abundance in Comet Levy (1990c). *T. Y. Brooke, A. T. Tokunaga, H. A. Weaver, G. Chin, & T. R. Gehelle.* 372, L113, 85-G1 (1991)
- WEAVER, K. A. *Einstein Observatory* SSS and MPC Observations of the Complex X-Ray Spectra of Seyfert Galaxies. *T. J. Turner, K. A. Weaver, R. F. Mushotzky, S. S. Holt, & G. M. Madejski.* 381, 85, 190-B1 (1991)
- WEAVER, KIMBERLY A. A Ubiquitous Absorption Feature in the X-Ray Spectra of BL Lacertae Objects. *Greg M. Madejski, Richard F. Mushotzky, Kimberly A. Weaver, Keith A. Arnaud, & C. Megan Urry.* 370, 198, 49-F1 (1991)
- WEBB, J. K. High-Resolution Spectroscopy of Q1100-264 Again. *R. F. Carswell, K. M. Lanzetta, H. C. Parnell, & J. K. Webb.* 371, 36, 60-E1 (1991)
- WEBB, J. R. See EDELSON, R. A., et al. Rapid Ultraviolet Variability in the BL Lacertae Object PKS 2155-304.
- See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.
- WEBBER, W. R. The  $^{54}\text{Mn}$  Clock and Its Implications for Cosmic-Ray Propagation and Fe Isotope Studies. *J. E. Grove, B. T. Hayes, R. A. Mewaldt, & W. R. Webber.* 377, 680, 148-B3 (1991)
- A Measurement of the Cosmic-Ray  $^2\text{H}$  and  $^3\text{H}$  Spectra and  $^2\text{H}/^3\text{H}$  and  $^3\text{He}/^4\text{He}$  Ratios in 1989. *W. R. Webber, R. L. Golden, S. J. Stochaj, J. F. Ormes, & R. E. Strittmatter.* 380, 230, 178-G9 (1991)
- WEBBINK, R. F. Gravitational Radiation from the Galaxy. *D. Hils, P. L. Bender, & R. F. Webbink.* 369, 271, 39-C9 (1991) (Orig. paper in 360, 75, 146-A6 (1990))
- WEBBINK, RONALD F. The White Dwarf Mass Distribution in Classical Nova Systems. *Hans Ritter, Michael Politano, Mario Livio, & Ronald F. Webbink.* 376, 177, 127-B10 (1991)
- WEBER, F. Structure and Stability of Rotating Relativistic Neutron Stars. *F. Weber, N. K. Glendenning, & M. K. Weigel.* 373, 579, 95-B10 (1991)
- WEEKES, T. C. See MACOMB, D. J., et al. Search for TeV Emission from 4U 0115+63.
- See VACANTI, G., et al. Gamma-Ray Observations of the Crab Nebula at TeV Energies.
- See AKERLOF, C. W., et al. Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy.
- See REYNOLDS, P. T., et al. Search for TeV Gamma-Ray Emission from Hercules X-1.
- WEGNER, GARY. A Spectrophotometric Atlas of White Dwarfs Compiled from the *IUE Archives*. *Gary Wegner & Steven R. Swanson.* 75, 507, 7-E13 (1991)
- Gravitational Redshift Determinations for White Dwarfs in Common Proper-Motion Binaries. *Gary Wegner & I. Neill Reid.* 375, 674, 121-B1 (1991)

- Gravitational Redshift for the Pleiad White Dwarf LB 1497.** *Gary Wegner, I. Neill Reid, & Robert K. McMahan, Jr.* 376, 186, 127-C6 (1991)
- WEGLER, R.** See QUIRRENBACH, A., et al. Correlated Radio and Optical Variability in the BL Lacertae Object 0716+714.
- WEHLAU, W. H.** Emission Features in the Spectrum of NGC 7027 near 3.3 Microns at Very High Resolution. *R. P. Lowe, J. M. Moorhead, W. H. Wehlau, & J.-P. Maillard.* 368, 195, 25-E1 (1991)
- WEIGEL, M. K.** Structure and Stability of Rotating Relativistic Neutron Stars. *F. Weber, N. K. Glendenning, & M. K. Weigel.* 373, 579, 95-B10 (1991)
- WEIGELT, G.** See MACCHETTO, F., et al. First Results from the Faint Object Camera: Observations of PKS 0521-36.
- See CRANE, P., et al. First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305.
- See JAKOBSEN, P., et al. First Results from the Faint Object Camera: SN 1987A.
- See PARESCHE, F., et al. First Results from the Faint Object Camera: Imaging the Core of R Aquarii.
- See MACCHETTO, F., et al. *HST* Observations of 3C 66B: A Double-stranded Optical Jet.
- See ALBRECHT, R., et al. First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System.
- First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula. *G. Weigelt, R. Albrecht, C. Barbieri, J. C. Blades, A. Bokkenberg, P. Crane, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kamperman, I. R. King, F. Macchetto, C. D. Mackay, F. Parese, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, & W. B. Sparks.* 378, L21, 157-C7 (1991)
- WEILER, KURT W.** A New Look at the "Jet" in the CTB 37A/B Supernova Remnant Complex. *Namir E. Kassim, Stefi A. Baum, & Kurt W. Weiler.* 374, 212, 100-F9 (1991)
- The 10 Year Radio Light Curves for SN 1979C. *Kurt W. Weiler, Schuyler D. Van Dyk, Nino Panagia, Richard A. Sramek, & Jennifer L. Discenna.* 380, 161, 178-B1 (1991)
- WEINBERG, DAVID H.** On the Population of H I Dwarf Galaxies. *David H. Weinberg, Arpad Szomoru, P. Guhathakurta, & J. H. van Gorkom.* 372, L13, 79-B11 (1991)
- WEINBERG, MARTIN D.** A Search for Instability in Two Families of Spherical Stellar Models. *Martin D. Weinberg.* 368, 66, 24-A1 (1991)
- Limits on Cluster Binaries. *Roger W. Romani & Martin D. Weinberg.* 372, 487, 81-G5 (1991)
- Vertical Oscillation of the Galactic Disk. *Martin D. Weinberg.* 373, 391, 92-G7 (1991)
- Wide Binaries in the Woolley Catalog. *Ira Wasserman & Martin D. Weinberg.* 382, 149, 202-A12 (1991)
- WEINTRAUB, DAVID A.** Are FU Orionis Stars Younger than T Tauri Stars? Submillimeter Constraints on Circumstellar Disks. *David A. Weintraub, Göran Sandell, & William D. Duncan.* 382, 270, 203-E8 (1991)
- WEIR, N.** Discovery of an Infrared Nucleus in Cygnus A: An Obscured Quasar Revealed? *S. Djorgovski, N. Weir, K. Matthews, & J. R. Graham.* 372, L67, 85-C5 (1991)
- WEISBERG, J. M.** H I Absorption Measurements toward 15 Pulsars and the Radial Distribution of Diffuse Ionized Gas in the Galaxy. *D. A. Frail, J. M. Cordes, T. H. Hankins, & J. M. Weisberg.* 382, 168, 202-C10 (1991)
- WEISHEIT, JON C.** Analysis of C IV Absorption Lines from Clouds at High Redshifts. *Wei Peng & Jon C. Weisheit.* 373, 471, 93-G4 (1991)
- WEISS, N. O.** Modeling Mesogranules and Exploders on the Solar Surface. *G. W. Simon, A. M. Title, & N. O. Weiss.* 375, 775, 122-C7 (1991)
- WEISS, R.** See SMOOT, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a 7° Beam by the *Cosmic Background Explorer* (COBE).
- WELCH, W. J.** Anatomy of the Barnard 5 Core. *G. A. Fuller, P. C. Myers, W. J. Welch, P. F. Goldsmith, W. D. Langer, B. G. Campbell, S. Guilloteau, & R. W. Wilson.* 376, 135, 126-E10 (1991)
- WELLS, LISA.** The Evolution and Classification of Postoutburst Novae Spectra. *R. E. Williams, M. Hamuy, M. M. Phillips, S. R. Heathcote, Lisa Wells, & M. Navarrete.* 376, 721, 135-C7 (1991)
- WELLS, W. K.** The Structure of Io's Corona. *N. M. Schneider, D. M. Hunten, W. K. Wells, A. B. Schultz, & U. Fink.* 368, 298, 27-G1 (1991)
- WELSH, B. Y.** Predicted Extreme-Ultraviolet Line Emission for Nearby Main-Sequence B Stars. *J. J. MacFarlane, J. P. Cassinelli, B. Y. Welsh, P. W. Vedder, J. V. Vallerga, & W. L. Waldron.* 380, 564, 185-C1 (1991)
- Further High-Resolution Na I Observations of the Local Interstellar Medium. *B. Y. Welsh, P. W. Vedder, J. V. Vallerga, & N. Craig.* 381, 462, 196-D7 (1991)
- WELSH, BARRY Y.** The Interstellar Tunnel of Neutral-free Gas toward  $\beta$  Canis Majoris. *Barry Y. Welsh.* 373, 556, 94-G8 (1991)
- WELSH, WILLIAM F.** Echo Mapping of Broad H $\beta$  Emission in NGC 5548. *Keith Horne, William F. Welsh, & Bradley M. Peterson.* 367, LS, 17-B10 (1991)
- Echo Images of Broad-Line Regions in Active Galactic Nuclei. *William F. Welsh & Keith Horne.* 379, 586, 172-A1 (1991)
- WELTY, ALAN D.** Optical Excess Emission in T Tauri Stars. *Patrick Hartigan, Scott J. Kenyon, Lee Hartmann, Stephen E. Strom, Suzan Edwards, Alan D. Welty, & John Stauffer.* 382, 617, 209-C1 (1991)
- WELTY, D. E.** Predicted Profiles of Ultraviolet Interstellar Absorption Lines. *D. E. Welty, L. M. Hobbs, & D. G. York.* 75, 425, 6-E5 (1991)
- The Interstellar D $_1$  Line at High Resolution. *L. M. Hobbs & D. E. Welty.* 368, 426, 30-D1 (1991)
- An Extreme Population II Dwarf without Lithium. *L. M. Hobbs, D. E. Welty, & J. A. Thorburn.* 373, L47, 97-B13 (1991)
- Variable Interstellar Absorption toward HD 72127A. II. 1981-1988. *L. M. Hobbs, R. Ferlet, D. E. Welty, & G. Wallerstein.* 378, 586, 159-F1 (1991)
- WENTZEL, DONAT G.** Solar and Stellar Radio Spikes: Limits on the Saturation of the Electron-Cyclotron Maser. *Donat G. Wentzel & Markus J. Aschwanden.* 372, 688, 84-C1 (1991)
- Direct Radiation from a Strong DC Electric Field. *Donat G. Wentzel.* 373, 285, 89-E3 (1991)
- WERNER, M. W.** Submillimeter Solar Limb Profiles Determined from Observations of the Total Solar Eclipse of 1988 March 18. *T. L. Roellig, E. E. Becklin, J. T. Jefferies, G. A. Kopp, C. A. Lindsey, F. Q. Orrall, & M. W. Werner.* 381, 288, 192-E5 (1991)
- WERNER, MICHAEL W.** Two Micron Morphology of Candidate Protostars. *Motohide Tamura, Ian Gatley, William Waller, & Michael W. Werner.* 374, L25, 103-E7 (1991)
- WESEMAEEL, F.** Synthetic Spectra and Atmospheric Properties of Cool DA White Dwarfs. *P. Bergeron, F. Wesemael, & G. Fontaine.* 367, 253, 15-C1 (1991)
- Adiabatic Properties of Pulsating DA White Dwarfs. I. The Treatment of the Brunt-Väisälä Frequency and the Region of Period Formation. *P. Brassard, G. Fontaine, F. Wesemael, S. D. Kawaler, & M. Tassoul.* 367, 601, 20-F11 (1991)
- The Isolated Massive DA White Dwarf GD 50. *P. Bergeron, K. M. Kidder, J. B. Holberg, James Liebert, F. Wesemael, & Rex A. Saffer.* 372, 267, 77-C5 (1991)
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- Discovery and Seismological Interpretation of Low-Amplitude Modes in the Pulsating DO White Dwarf PG 1707+427 (V817 Herculis). *G. Fontaine, P. Bergeron, G. Vauclair, P. Brassard, F. Wesemael, S. D. Kawaler, A. D. Grauer, & D. E. Winget.* 378, L49, 162-F1 (1991)
- WESSOLOWSKI, ULF.** Non-LTE Analysis of the Ofpe/WN9 Star HDE 269227 (R84). *Werner Schmutz, Claus Leitherer, Ivan Hubeny, Manfred Vogel, Wolf-Rainer Hamann, & Ulf Wessolowski.* 372, 664, 84-A1 (1991)
- WESSON, PAUL S.** Olbers's Paradox and the Spectral Intensity of the Extragalactic Background Light. *Paul S. Wesson.* 367, 399, 18-D5 (1991)
- Cosmological Constraints on the Zero-Point Electromagnetic Field. *Paul S. Wesson.* 378, 466, 158-C1 (1991)

- WEST, E. A. Vector Magnetic Fields in Sunspots. I. Stokes Profile Analysis Using the Marshall Space Flight Center Magnetograph. *K. S. Balasubramaniam & E. A. West.* 382, 699, 210-C11 (1991)
- WEST, MICHAEL J. Filamentary Superclustering in a Universe Dominated by Cold Dark Matter. *Michael J. West, Jens V. Villumsen, & Avishai Dekel.* 369, 287, 41-C7 (1991)
- The Correlation Function of cD Clusters. *Michael J. West & Sidney van den Berg.* 373, 1, 86-B1 (1991)
- Superclustering at High Redshifts. *Michael J. West.* 379, 19, 163-C7 (1991)
- WESTMACOTT, R. See HUTCHINGS, J. B., et al. First Results from the Goddard High-Resolution Spectrograph: Ultraviolet Spectra of a Starburst Knot in NGC 1068.
- WESTPHAL, JAMES A. See LYND, ROGER, et al. NGC 1068: Resolution of Nuclear Structure in the Optical Continuum.
- See HOLTZMAN, JON A., et al. Stellar Photometry with the *Hubble Space Telescope* Wide-Field/Planetary Camera: A Progress Report.
- See LAUER, TOD R., et al. The Core of the Nearby S0 Galaxy NGC 7457 Imaged with the *HST* Planetary Camera.
- See LAUER, TOD R., et al. The Postcollapse Core of M15 Imaged with the *HST* Planetary Camera.
- Hubble Space Telescope* Wide-Field/Planetary Camera Images of Saturn. *James A. Westphal, William A. Baum, Tod R. Lauer, G. Edward Danielson, Douglas G. Currie, S. P. Ewald, S. M. Faber, Edward J. Groth, J. Jeff Hester, Robert M. Light, Roger Lynds, Earl J. O'Neil, Jr., P. Kenneth Seidelmann, Edward J. Shaya, & Bradford A. Smith.* 369, L51, 45-G1 (1991)
- See HESTER, J. JEFF, et al. Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0''.1.
- WEYMANN, R. J. See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- WEYMANN, RAY J. Comparisons of the Emission-Line and Continuum Properties of Broad Absorption Line and Normal Quasi-stellar Objects. *Ray J. Weymann, Simon L. Morris, Craig B. Foltz, & Paul C. Hewett.* 373, 23, 86-C13 (1991)
- A High Signal-to-Noise Ratio Composite Quasar Spectrum. *Paul J. Francis, Paul C. Hewett, Craig B. Foltz, Frederic H. Chaffee, Ray J. Weymann, & Simon L. Morris.* 373, 465, 93-F10 (1991)
- First Results from the Goddard High-Resolution Spectrograph: The Galactic Halo and the Ly $\alpha$  Forest at Low Redshift in 3C 273. *Simon L. Morris, Ray J. Weymann, Blair D. Savage, & Ronald L. Gilliland.* 377, L21, 143-C11 (1991)
- WHANG, Y. C. Parametric Study of the Formation of Magnetohydrodynamic Shocks. I. Model. *Y. C. Whang.* 377, 250, 141-B1 (1991)
- Parametric Study of the Formation of Magnetohydrodynamic Shocks. II. Slow Shocks. *Y. C. Whang.* 377, 255, 141-B7 (1991)
- Parametric Study of the Formation of Magnetohydrodynamic Shocks. III. Fast and Slow Shocks. *Y. C. Whang.* 381, 559, 197-E10 (1991)
- WHEATON, W. A. HEAO 3 Upper Limits to Pulsed Gamma-Ray Emission from PSR 1509-58 and PSR 0833-45. *M. P. Ulmer, W. R. Purcell, W. A. Wheaton, & W. A. Mahoney.* 369, 485, 43-F12 (1991)
- SMM/HXRBS Observations of Cygnus X-1 from 1986 December to 1988 April. *R. A. Schwartz, L. E. Orwig, B. R. Dennis, J. C. Ling, & W. A. Wheaton.* 376, 312, 128-G1 (1991)
- WHEELER, B. See MATTHEWS, J., et al. Search for Diffuse Cosmic Gamma Rays above 200 TeV.
- WHEELER, J. CRAIG. Model Light Curves of Linear Type II Supernovae. *Douglas A. Swartz, J. Craig Wheeler, & Robert P. Harkness.* 374, 266, 101-D7 (1991)
- A Statistical Study of the Correlation of Galactic Supernova Remnants and Spiral Arms. *Zongwei Li, J. Craig Wheeler, Frank N. Bash, & W. H. Jefferys.* 378, 93, 152-B9 (1991)
- The Late-Time Light Curve of SN 1984L. *Douglas A. Swartz & J. Craig Wheeler.* 379, L13, 169-B7 (1991)
- WHIPPLE, A. L. See FRANZ, O. G., et al. Binary Star Observations with the *Hubble Space Telescope* Fine Guidance Sensors. I. ADS 11300.
- WHITAKER, T. See AKERLOF, C. W., et al. Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy.
- WHITE, DAVID A. Ram-Pressure Stripping of the Multiphase Interstellar Medium of the Virgo Cluster Elliptical Galaxy M86 (NGC 4406). *David A. White, A. C. Fabian, W. Forman, C. Jones, & C. Stern.* 375, 35, 111-D9 (1991)
- WHITE, N. E. The Discovery of an X-Ray Burst and a Study of Aperiodic Variability from SMC X-1. *L. Angelini, L. Stella, & N. E. White.* 371, 332, 64-C1 (1991)
- WHITE, RAYMOND E., III. The Metal Abundance and Specific Energy of Intracluster Gas. *Raymond E. White III.* 367, 69, 12-G8 (1991)
- Evidence for Environmental Effects on Early-Type Galaxy X-Ray Halos. *Raymond E. White III & Craig L. Sarazin.* 367, 476, 19-C9 (1991)
- WHITE, RICHARD L. Nonthermal X-Ray Emission from Winds of OB Supergiants. *Wan Chen & Richard L. White.* 366, 512, 9-D1 (1991)
- The Infrared Properties of Compact Galactic Radio Sources: The Young and the Restless. *Richard L. White, Robert H. Becker, & David J. Helfand.* 371, 148, 62-A1 (1991)
- Supernova Remnant Evolution in an Interstellar Medium with Evaporating Clouds. *Richard L. White & Knox S. Long.* 373, 543, 94-F7 (1991)
- W28 and 3C 400.2: Two Shell-like Radio Supernova Remnants with Centrally Peaked X-Ray Morphologies. *Knox S. Long, William P. Blair, Richard L. White, & Yuuka Matsui.* 373, 567, 95-A10 (1991)
- Inverse-Compton Gamma-Ray Emission from Chaotic, Early-Type Stellar Winds and Its Detectability by *Gamma Ray Observatory*. *Wan Chen & Richard L. White.* 381, L63, 199-E1 (1991)
- WHITE, S. M. See NITTA, N., et al. Coronal Magnetic Structures Observing Campaign. I. Simultaneous Microwave and Soft X-Ray Observations of Active Regions at the Solar Limb.
- Large-Scale Features of the Sun at 20 Centimeter Wavelength. *N. Gopalswamy, S. M. White, & M. R. Kundu.* 379, 366, 167-E9 (1991)
- WHITE, SIMON D. M. Voids in a Neutrino-dominated Universe. *Ning Zeng & Simon D. M. White.* 374, 1, 98-B1 (1991)
- Galaxy Formation through Hierarchical Clustering. *Simon D. M. White & Carlos S. Frenk.* 379, 52, 163-F3 (1991)
- WHITFORD, A. E. Galactic Bulge M Giants. IV. 0.5-2.5 Micron Spectrophotometry and Abundances for Stars in Baade's Window. *D. M. Terndrup, Jay A. Frogel, & A. E. Whitford.* 378, 742, 161-E5 (1991)
- WHITMORE, BRADLEY C. On the Interpretation of the Morphology-Density Relation for Galaxies in Clusters. *Bradley C. Whitmore & Diane M. Gilmore.* 367, 64, 12-G1 (1991)
- Optical Colors of Early-Type Galaxies in Compact Groups. *Stephen E. Zepf, Bradley C. Whitmore, & Harold F. Levison.* 383, 524, 220-G1 (1991)
- Modeling the Evolution of Galaxies in Compact Groups. *Stephen E. Zepf & Bradley C. Whitmore.* 383, 542, 221-A8 (1991)
- WHITNEY, B. A. See TAYLOR, M., et al. First Ultraviolet Spectropolarimetry of Hot Supergiants.
- See BJORKMAN, K. S., et al. First Ultraviolet Spectropolarimetry of Be Stars from the Wisconsin Ultraviolet Photo-Polarimeter Experiment.
- WHITNEY, BARBARA A. Thomson Scattering in a Magnetic Field. II. Arbitrary Field Orientation. *Barbara A. Whitney.* 369, 451, 43-C10 (1991)
- Thomson Scattering in a Magnetic Field. I. Field along z. *Barbara A. Whitney.* 75, 1293, 22-F1 (1991)
- WHITTLE, M. The Featureless Continua and Hydrogen Lines of Seyfert 2 Galaxies. *A. L. Kinney, R. R. J. Antonucci, M. J. Ward, A. S. Wilson, & M. Whittle.* 377, 100, 139-C5 (1991)
- WIBBERENZ, G. Particle Injection following Solar Flares on 1980 May 28 and June 8: Evidence for Different Injection Time Histories in Impulsive and Gradual Events? *M.-B. Kallenrode & G. Wibberenz.* 376, 787, 136-B8 (1991)
- WICKRAMASINGHE, D. T. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- WIDING, K. G. Fe XII Line Ratios in Solar Flares. *S. S. Tayal, Ronald J. W. Henry, F. P. Keenan, S. M. McCann, & K. G. Widing.* 369, 567, 44-G1 (1991)

- Analysis of the Solar O II/O III Multiplets at 834 Å: Implications for the Emission Measure Distribution in the Vicinity of 40,000 K.** *R. R. Meier, K. G. Widing, & U. Feldman.* 369, 570, 44-G7 (1991)
- Fe XIV Line Ratios in the Sun.** *F. P. Keenan, P. L. Dufton, M. B. Boylan, A. E. Kingston, & K. G. Widing.* 373, 695, 96-E13 (1991)
- The 3s<sup>2</sup>3p<sup>2</sup>P-3s3p<sup>2</sup>P Intercombination Lines of Fe XIV in the Sun.** *F. P. Keenan, P. L. Dufton, E. S. Conlon, M. B. Boylan, A. E. Kingston, & K. G. Widing.* 379, 406, 168-A11 (1991)
- Improved Line Ratio Calculations Involving  $\Delta n = 1$  (2-3) Transitions in O V and a Reanalysis of *Skylab* Observations of Solar Flares.** *F. P. Keenan, P. L. Dufton, L. K. Harra, E. S. Conlon, K. A. Barrington, A. E. Kingston, & K. G. Widing.* 382, 349, 204-E1 (1991)
- WIDROW, LAWRENCE M.** *Microwave Distortions from Collapsing Domain-Wall Bubbles.* *Michael S. Turner, Richard Watkins, & Lawrence M. Widrow.* 367, L43, 22-B1 (1991)
- WIEDEMANN, G. R.** *CN and HCN in the Infrared Spectrum of IRC +10216.* *G. R. Wiedemann, Kenneth H. Hinkle, John J. Keady, D. Denning, & D. E. Jennings.* 382, 321, 204-B10 (1991)
- WIEDEMANN, GÜNTHER.** *Detection of <sup>13</sup>C-Ethane in Jupiter's Atmosphere.* *Günter Wiedemann, Gordon L. Björaker, & Donald E. Jennings.* 383, L29, 219-D7 (1991)
- WIGGS, MICHAEL S.** *A Spectroscopic Search for Colliding Stellar Winds in O-Type Close Binary Systems. I. AO Cassiopeiae.* *Douglas R. Gies & Michael S. Wiggs.* 375, 321, 114-G10 (1991)
- WIITA, PAUL J.** *Statistical Analysis of Power-Size-Redshift Distributions of Extragalactic Jets.* *Alexander Rosen & Paul J. Wiita.* 371, 501, 67-F10 (1991)
- Beams Crossing a Galactic Halo-Intergalactic Medium Interface and the Size of Extragalactic Radio Sources: Erratum.** *Alexander Rosen & Paul J. Wiita.* 372, 349, 78-C7 (1991) (Orig. paper in 330, 16, 90-B11 (1988))
- Gaseous Halos of Elliptical Galaxies, the Cosmic Evolution of Their Radio Sizes, and the Phenomenon of Compact Steep-Spectrum Sources.** *Gopal-Krishna & Paul J. Wiita.* 373, 325, 92-B1 (1991)
- WILCOTS, ERIC M.** *VLA Observations of 21 Centimeter H I Absorption toward Cassiopeia A.* *John H. Bieging, W. Miller Goss, & Eric M. Wilcots.* 75, 999, 16-F5 (1991)
- WILD, W.** *The Molecular Interstellar Medium and the Near-Infrared Continuum of the Barred LINER NGC 6764.* *A. Eckart, M. Cameron, J. M. Jackson, R. Genzel, A. I. Harris, W. Wild, & H. Zinnecker.* 372, 67, 74-G9 (1991)
- WILD, WALTER J.** *Light-Curve Inversion Formalism.* *Walter J. Wild.* 368, 622, 32-G9 (1991)
- WILD, WOLFGANG.** *The Interstellar Medium of the Hot-Spot Galaxy NGC 2903.* *James M. Jackson, Andreas Eckart, Murray Cameron, Wolfgang Wild, Paul T. P. Ho, Richard W. Pogge, & Andrew I. Harris.* 375, 105, 112-C9 (1991)
- WILKES, B. J.** *See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.*
- WILKES, BELINDA J.** *Persistence and Change in the Soft X-Ray Spectrum of the Quasar PG 1211+143.* *Martin Elvis, P. Giommi, Belinda J. Wilkes, & Jonathan McDowell.* 378, 537, 159-B1 (1991)
- WILKING, BRUCE A.** *A Search for Embedded Young Stellar Objects in and near the IC 1396 Complex.* *Richard D. Schwartz, Armen L. Gyulbudaghian, & Bruce A. Wilking.* 370, 263, 50-D9 (1991)
- WILKINSON, D. T.** *See SMOOTH, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.*
- See WRIGHT, E. L., et al. Preliminary Spectral Observations of the Galaxy with a 7° Beam by the Cosmic Background Explorer (COBE).*
- WILLETTE, GREGORY.** *Implications of Solar p-Mode Frequency Shifts.* *Peter Goldreich, Norman Murray, Gregory Willette, & Pawan Kumar.* 370, 752, 57-F12 (1991)
- WILLIAMS, B. A.** *The Distance to the Coma Cluster Using the B-Band Tully-Fisher Relation.* *M. Fukugita, S. Okamura, K. Tarusawa, H. J. Rood, & B. A. Williams.* 376, 8, 125-B9 (1991)
- WILLIAMS, L. L.** *Viscosity and Inertia in Cosmic-Ray Transport: Effects of an Average Magnetic Field.* *L. L. Williams & J. R. Jokipii.* 371, 639, 69-E3 (1991)
- WILLIAMS, O. R.** *See KII, T., et al. X-Ray Continuum and Evidence for an Iron Emission Line from the Quasar E1821+643.*
- WILLIAMS, P. M.** *IRAS 17380-3031: A New Dusty Late WC-Type Wolf-Rayet Star.* *Martin Cohen, K. A. van der Hucht, P. M. Williams, & P. S. Thé.* 378, 302, 154-F7 (1991)
- WILLIAMS, R. E.** *Multiwavelength Observations of Nova LMC 1990 Number 2: The First Extragalactic Recurrent Nova.* *Steven N. Shore, George Sonneborn, Sunner G. Starrfield, M. Hamuy, R. E. Williams, A. Cassatella, & H. Drechsel.* 370, 193, 49-E8 (1991)
- The Evolution and Classification of Postoutburst Novae Spectra.** *R. E. Williams, M. Hamuy, M. M. Phillips, S. R. Heathcote, Lisa Wells, & M. Navarrete.* 376, 721, 135-C7 (1991)
- WILLIAMS, ROBERT E.** *See SAIZAR, PEDRO, et al. PW Vulpeculae: A Nova with Nearly Solar Abundances.*
- WILLIS, A. G.** *An X-Ray and Radio Study of Steep-Spectrum Radio Sources. II. Four Fields from a 22 MHz Polar Cap Survey.* *P. E. Dewdney, C. H. Costain, I. McHardy, A. G. Willis, D. E. Harris, & C. P. Stern.* 76, 1055, 40-D1 (1991)
- WILLMORE, A. P.** *The Distribution of Dark Matter in the Perseus Cluster.* *C. J. Eyles, M. P. Watt, D. Bertram, M. J. Church, T. J. Ponman, G. K. Skinner, & A. P. Willmore.* 376, 23, 125-C12 (1991)
- WILLNER, S. P.** *Infrared Images, Virgo Spirals, and the Tully-Fisher Law.* *R. F. Peletier & S. P. Willner.* 382, 382, 206-C13 (1991)
- WILLS, B. J.** *See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.*
- See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.*
- WILLS, BEVERLEY J.** *Optical and Near-Infrared Polarimetry of the Infrared Luminous Galaxy IRAS 23060+0505.* *J. H. Hough, C. Brindle, Beverley J. Wills, D. Wills, & J. Bailey.* 372, 478, 81-F9 (1991)
- WILLS, D.** *See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.*
- Optical and Near-Infrared Polarimetry of the Infrared Luminous Galaxy IRAS 23060+0505.* *J. H. Hough, C. Brindle, Beverley J. Wills, D. Wills, & J. Bailey.* 372, 478, 81-F9 (1991)
- See KAWAI, N., et al. Multifrequency Observations of BL Lacertae in 1988.*
- WILLSON, L. A.** *From Wind to Superwind: The Evolution of Mass-Loss Rates for Mira Models.* *G. H. Bowen & L. A. Willson.* 375, L53, 124-C1 (1991)
- WILLSON, ROBERT F.** *Multi-Wave Band SMM-VLA Observations of an M2 Flare and an Associated Coronal Mass Ejection.* *Robert F. Willson, Joan T. Schmelz, Raymond D. Gonzalez, Kenneth R. Lang, & Kermit L. Smith.* 378, 360, 155-D6 (1991)
- WILNER, D.** *CO J = 3-2 and J = 2-1 Observations of NGC 7027.* *P. A. Jaminet, W. C. Danchi, E. C. Sutton, A. P. G. Russell, Göran Sandell, J. H. Bieging, & D. Wilner.* 380, 461, 184-A4 (1991)
- WILNER, DAVID.** *The Molecular Envelope of NGC 7027.* *John H. Bieging, David Wilner, & Harley A. Thronson, Jr.* 379, 271, 166-D9 (1991)
- WILSON, A. S.** *Extended X-Ray Emission in Nearby Seyfert Galaxies.* *Martin Elvis, C. Fassnacht, A. S. Wilson, & U. Briel.* 371, 820, 71-F12 (1991) (Orig. paper in 361, 459, 163-G1 (1990))
- The Expansion of the Crab Nebula.* *M. F. Bietenholz, P. P. Kronberg, D. E. Hogg, & A. S. Wilson.* 373, L59, 97-D5 (1991)
- The Featureless Continuum and Hydrogen Lines of Seyfert 2 Galaxies.* *A. L. Kinney, R. R. J. Antonucci, M. J. Ward, A. S. Wilson, & M. Whittle.* 377, 100, 139-C5 (1991)
- The Starburst Ring around the Seyfert Nucleus in NGC 7469.* *A. S. Wilson, T. T. Helfer, C. A. Haniff, & M. J. Ward.* 381, 79, 190-A6 (1991)
- WILSON, ANDREW S.** *High-Excitation Extranuclear Gas in Seyfert Galaxies.* *Christopher A. Haniff, Martin J. Ward, & Andrew S. Wilson.* 368, 167, 25-B5 (1991)
- Ultramassive ( $\sim 10^{11} M_{\odot}$ ) Dark Core in the Luminous Infrared Galaxy NGC 6240?* *Jonathan Bland-Hawthorn, Andrew S. Wilson, & R. Brent Tully.* 371, L19, 66-C7 (1991)

- Infrared Spectroscopy of Cygnus A: Implications for the Obscured Active Nucleus. *Martin J. Ward, Philip R. Blanco, Andrew S. Wilson, & Minoru Nishida.* 382, 115, 201-E1 (1991)
- WILSON, CHRISTINE D. The Star-forming Disk and CO Bar in M101. *Jeffrey D. P. Kenney, Nick Z. Scoville, & Christine D. Wilson.* 366, 432, 8-C1 (1991)
- OB Star Formation and H I Production in Molecular Clouds in M33. *Christine D. Wilson & Nick Scoville.* 370, 184, 49-D11 (1991)
- The Molecular Gas Content of the Nuclear Region of M33: Erratum. *Christine D. Wilson & Nick Scoville.* 372, 349, 78-C7 (1991) (Orig. paper in 347, 743, 192-E7 (1989))
- New Cepheid Distances to Nearby Galaxies Based on *BVRJ* CCD Photometry. II. The Local Group Galaxy M33. *Wendy L. Freedman, Christine D. Wilson, & Barry F. Madore.* 372, 455, 81-D9 (1991)
- WILSON, JAMES R. Hard X-Ray Spectra from Gap Accretion onto Neutron Stars. *Włodzimierz Kluźniak & James R. Wilson.* 372, L87, 85-E1 (1991)
- WILSON, OLIN C. See DUNCAN, DOUGLAS K., et al. Ca II H and K Measurements Made at Mount Wilson Observatory, 1966-1983.
- WILSON, R. W. Anatomy of the Barnard 5 Core. *G. A. Fuller, P. C. Myers, W. J. Welch, P. F. Goldsmith, W. D. Langer, B. G. Campbell, S. Guilloteau, & R. W. Wilson.* 376, 135, 126-E10 (1991)
- WILSON, T. L. NGC 7538 IRS 1: Subarcsecond Resolution Recombination Line and  $^{15}\text{NH}_3$  Maser Observations. *R. A. Gaume, K. J. Johnston, H. A. Nguyen, T. L. Wilson, H. R. Dickel, W. M. Goss, & M. C. H. Wright.* 376, 608, 133-G12 (1991)
- WILSON, TERESA D. Absolute Magnitudes and Kinematic Properties of Cepheids. *Teresa D. Wilson, Thomas G. Barnes III, Suzanne L. Hawley, & William H. Jefferys.* 378, 708, 161-B11 (1991)
- WILSON, W. J. See WANNIER, P. G., et al. Water in Dense Molecular Clouds.
- WINDHORST, ROGIER A. The Discovery of a Young Radio Galaxy at  $z = 2.390$ : Probing Initial Star Formation at  $z \lesssim 3.0$ . *Rogier A. Windhorst, David Burstein, Doug F. Mathis, Lyman W. Neuschaefer, F. Bertola, L. M. Buson, David C. Koo, Keith Matthews, Peter D. Barthel, & K. C. Chambers.* 380, 362, 182-G1 (1991)
- The Galaxy Two-Point Correlation Function Down to  $V = 26$  Magnitudes on 0.5° Scales. *Lyman W. Neuschaefer, Rogier A. Windhorst, & Alan Dressler.* 382, 32, 200-D12 (1991)
- The Ultraviolet Spectra of Nearby Radio Galaxies. *William C. Keel & Rogier A. Windhorst.* 383, 135, 213-F3 (1991)
- WINGET, D. E. Asteroseismology of White Dwarf Stars. I. Adiabatic Results. *P. A. Bradley & D. E. Winget.* 75, 463, 7-A13 (1991)
- Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope. *D. E. Winget, R. E. Nather, J. C. Clemens, J. Provencal, S. J. Kleinman, P. A. Bradley, M. A. Wood, C. F. Claver, M. L. Fruch, A. D. Grauer, B. P. Hine, C. J. Hansen, G. Fontaine, N. Achilleos, D. T. Wickramasinghe, T. M. K. Maras, S. Seetha, B. N. Ashoka, D. O'Donoghue, B. Warner, D. W. Kurtz, D. A. Buckley, J. Brickhill, G. Vauclair, N. Dolez, M. Chevreton, M. A. Barstow, J. E. Solheim, A. Kanaan, S. O. Keppler, G. W. Henry, & S. D. Kawaler.* 378, 326, 155-A10 (1991)
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- Discovery and Seismological Interpretation of Low-Amplitude Modes in the Pulsating DO White Dwarf PG 1707+427 (V817 Herculis). *G. Fontaine, P. Bergeron, G. Vauclair, P. Brassard, F. Wesemael, S. D. Kawaler, A. D. Grauer, & D. E. Winget.* 378, L49, 162-F1 (1991)
- WINGLEE, R. M. Interrelation of Soft and Hard X-Ray Emissions during Solar Flares. I. Observations. *R. M. Winglee, A. L. Kiplinger, D. M. Zarro, G. A. Dulk, & J. R. Lemen.* 375, 366, 115-D13 (1991)
- Interrelation of Soft and Hard X-Ray Emissions during Solar Flares. II. Simulation Model. *R. M. Winglee, G. A. Dulk, P. L. Bommann, & J. C. Brown.* 375, 382, 115-F1 (1991)
- WINKLER, P. FRANK. Six Balmer-dominated Supernova Remnants. *R. Chris Smith, Robert P. Kirshner, William P. Blair, & P. Frank Winkler.* 375, 652, 120-G1 (1991)
- WIRSICH, J. Dust Temperatures in the Circumstellar Shell of TX Piscium. *J. Wirsich.* 377, 285, 141-E1 (1991)
- WITT, ADOLF N. X Marks the Spot: Distribution and Excitation of Unidentified Molecules in the Red Rectangle. *Gary D. Schmidt & Adolf N. Witt.* 383, 698, 222-G12 (1991)
- WITZEL, A. See QUIRRENBACH, A., et al. Correlated Radio and Optical Variability in the BL Lacertae Object 0716+714.
- WOLFE, ARTHUR M. The Redshift Distribution of Ly $\alpha$  Clouds and the Proximity Effect. *Limin Lu, Arthur M. Wolfe, & David A. Turnshek.* 367, 19, 12-C5 (1991)
- A New Spectroscopic Survey for Damped Ly $\alpha$  Absorption Lines from High-Redshift Galaxies. *Kenneth M. Lanzetta, Arthur M. Wolfe, David A. Turnshek, Limin Lu, Richard G. McMahon, & Cyril Hazard.* 77, 1, 43-B1 (1991)
- WOLFENDALE, A. W. Cosmic Rays and Cosmological Microwave Background Fluctuations. *A. J. Banday, M. Giler, B. Szabelska, J. Szabelski, & A. W. Wolfendale.* 375, 432, 118-B5 (1991)
- WOLFF, MICHAEL T. Noise-driven Radiative Shocks: A New Model for the Optical Quasi-periodic Oscillations of the AM Herculis Objects. *Michael T. Wolff, Kent S. Wood, & James N. Imamura.* 375, L31, 117-D6 (1991)
- The Optical Emission from Oscillating White Dwarf Radiative Shock Waves. *James N. Imamura, Hussain Rashed, & Michael T. Wolff.* 378, 665, 160-F5 (1991)
- High-Speed Multicolor Photometry of V834 Centaurus. *John Middleditch, James N. Imamura, Michael T. Wolff, & Thomas Y. Steiman-Cameron.* 382, 315, 204-B1 (1991)
- WOLFIRE, MARK G. Molecular Line Emission Models of Herbig-Haro Objects. I. H $_2$  Emission. *Mark G. Wolfire & Arieh Königl.* 383, 205, 214-E9 (1991)
- WOLFSON, RICHARD. Force-free Magnetic Fields: Generating Functions and Footpoint Displacements. *Richard Wolfsen & Ritu Verma.* 375, 254, 114-B7 (1991)
- WOLSZCZAN, A. Discovery of a Young, 267 Millisecond Pulsar in the Supernova Remnant W44. *A. Wolszczan, J. M. Cordes, & R. J. Dewey.* 372, L99, 85-F1 (1991)
- Timing Observations of the 8 Hour Binary Pulsar 2127+11C in the Globular Cluster M15. *T. A. Prince, S. B. Anderson, S. R. Kulkarni, & A. Wolszczan.* 374, L41, 110-C1 (1991)
- Time Variability of Pulsar Dispersion Measures. *J. A. Phillips & A. Wolszczan.* 382, L27, 205-D1 (1991)
- WOLTER, A. The *Einstein Observatory* Extended Medium-Sensitivity Survey. II. The Optical Identifications. *John T. Stocke, Simon L. Morris, I. M. Gioia, T. Maccacaro, R. Schild, A. Wolter, Thomas A. Fleming, & J. Patrick Henry.* 76, 813, 36-B1 (1991)
- WOLTER, A. The Number Count Distribution for X-Ray-selected BL Lacertae Objects and Constraints on the Luminosity Function. *Anna Wolter, I. M. Gioia, T. Maccacaro, S. L. Morris, & J. T. Stocke.* 369, 314, 41-F5 (1991)
- The Properties of X-Ray-selected Active Galactic Nuclei. I. Luminosity Function, Cosmological Evolution, and Contribution to the Diffuse X-Ray Background. *Tommaso Maccacaro, Roberto Della Ceca, Isabella M. Gioia, Simon L. Morris, John T. Stocke, & Anna Wolter.* 374, 117, 99-D11 (1991)
- The Luminosity Function and Cosmological Evolution of X-Ray-selected BL Lacertae Objects. *Simon L. Morris, John T. Stocke, Isabella M. Gioia, Rudy E. Schild, Anna Wolter, Tommaso Maccacaro, & Roberto Della Ceca.* 380, 49, 176-F1 (1991)
- WOMACK, M. N<sub>2</sub>H<sup>+</sup> in Orion: Chemical Clues to the Dynamics of the Quiescent Gas. *M. Womack, L. M. Ziurys, & S. Wyckoff.* 370, L99, 59-F1 (1991)
- WOOD, DOUGLAS O. S. Bow Shock Models of Ultracompact H II Regions. *Mordecai-Mark Mac Low, Dave Van Buren, Douglas O. S. Wood, & Ed Churchwell.* 369, 395, 42-F1 (1991)
- The Dynamics and Physical Properties of the Cometary Nebula G29.96-0.02. *Douglas O. S. Wood & Ed Churchwell.* 372, 199, 76-D8 (1991)
- WOOD, JANET H. Eclipse Studies of the Dwarf Nova HT Cassiopeiae. I. Observations and System Parameters. *Keith Horne, Janet H. Wood, & Rae E. Stiening.* 378, 271, 154-C11 (1991)
- IUE Spectra of the Eclipsing Binary NN Serpentis. *Janet H. Wood & Thomas R. Marsh.* 381, 551, 197-E1 (1991)
- WOOD, K. Observations of Scorpius X-1 with IUE: Ultraviolet Results from a Multiwavelength Campaign. *S. D. Vrilek, W. Penninx,*

- J. C. Raymond, F. Verbunt, P. Hertz, K. Wood, W. H. G. Lewin, & K. Mitsuda. 376, 278, 128-D1 (1991)
- WOOD, K. S. Searches for Millisecond Pulsations in Low-Mass X-Ray Binaries. K. S. Wood, J. P. Norris, P. Hertz, B. A. Vaughan, P. F. Michelson, K. Mitsuda, W. H. G. Lewin, J. van Paradijs, W. Penninx, & M. van der Klis. 379, 295, 166-F9 (1991)
- WOOD, KENT S. Constraints on Weyl Gravity on Subgalactic Distance Scales. Kent S. Wood & Robert J. Nemiroff. 369, 54, 36-F3 (1991)
- Noise-driven Radiative Shocks: A New Model for the Optical Quasi-periodic Oscillations of the AM Herculis Objects. Michael T. Wolff, Kent S. Wood, & James N. Imamura. 375, L31, 117-D6 (1991)
- WOOD, M. A. See WINGET, D. E., et al. Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope.
- See KEPLER, S. O., et al. A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.
- WOOD, P. R. Observation of Neutral Hydrogen in the Globular Cluster NGC 2808. D. J. Faulkner, Tania R. Scott, P. R. Wood, & Alan E. Wright. 374, L45, 110-C6 (1991)
- WOODARD, L. See DUNCAN, DOUGLAS K., et al. Ca II H and K Measurements Made at Mount Wilson Observatory, 1966-1983.
- WOODARD, M. F. Short-Term Changes in Solar Oscillation Frequencies and Solar Activity. M. F. Woodard, J. R. Kuhn, N. Murray, & K. G. Libbrecht. 373, L81, 97-F12 (1991)
- Is There an Acoustic Resonance in the Solar Chromosphere? M. F. Woodard & K. G. Libbrecht. 374, L61, 110-E1 (1991)
- WOODGATE, BRUCE E. Discovery of a Ly $\alpha$  Galaxy near a Damped Ly $\alpha$  Absorber at  $z = 2.3$ . James D. Lowenthal, Craig J. Hogan, Richard F. Green, Adeline Caulet, Bruce E. Woodgate, Larry Brown, & Craig B. Foltz. 377, L73, 150-C1 (1991)
- WOODS, D. T. Supernova Remnants in Dense Clouds. I. Blast-Wave Dynamics and X-Ray Irradiation. B. T. Draine & D. T. Woods. 383, 621, 222-A6 (1991)
- WOODS, D. TOD. The Effects of Mass Flow on the Temperature and Abundance Structure of the Solar Transition Region. D. Tod Woods & Thomas E. Holzer. 375, 800, 122-E7 (1991)
- WOODWARD, CHARLES E. Near-Infrared [Fe II] Emission of M82 Supernova Remnants: Implications for Tracing the Supernova Content of Galaxies. Matthew A. Greenhouse, Charles E. Woodward, Harley A. Thronson, Jr., Richard J. Rudy, George S. Rossano, Peter Erwin, & R. C. Puett. 383, 164, 214-B1 (1991)
- WOOSLEY, S. E.  $^{57}$ Co and  $^{44}$ Ti Production in SN 1987A. S. E. Woosley & Robert D. Hoffman. 368, L31, 35-B10 (1991)
- A New Site for the Astrophysical Gamma-Process. W. Michael Howard, Bradley S. Meyer, & S. E. Woosley. 373, L5, 91-B1 (1991)
- WOOTTON, ALWYN. Fossil DCN in Orion-KL. Jeffrey G. Mangum, Richard L. Plambeck, & Alwyn Wootton. 369, 169, 38-A11 (1991)
- Synthesis Imaging of the DR 21(OH) Cluster. I. Dust Continuum and C $^{18}$ O Emission. Jeffrey G. Mangum, Alwyn Wootton, & Lee G. Mundy. 378, 576, 159-E3 (1991)
- Detection of Interstellar H $_3$ O $^+$ : A Confirming Line. Alwyn Wootton, J. G. Mangum, B. E. Turner, M. Boley, F. Boulanger, F. Combes, P. J. Encrana, & M. Gerin. 380, L79, 188-E6 (1991)
- WRIGHT, A. E. See MOULD, J. R., et al. The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. I. Southern Clusters.
- WRIGHT, ALAN E. Observation of Neutral Hydrogen in the Globular Cluster NGC 2808. D. J. Faulkner, Tania R. Scott, P. R. Wood, & Alan E. Wright. 374, L45, 110-C6 (1991)
- WRIGHT, C. S. Solar Gamma-Ray-Line Flares, Type II Radio Bursts, and Coronal Mass Ejections. E. W. Cliver, H. V. Cane, D. J. Forrest, M. J. Koomen, R. A. Howard, & C. S. Wright. 379, 741, 174-A2 (1991)
- WRIGHT, E. L. See SMOOT, G. F., et al. Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.
- Preliminary Spectral Observations of the Galaxy with a 7° Beam by the Cosmic Background Explorer (COBE). E. L. Wright, J. C. Mather, C. L. Bennett, E. S. Cheng, R. A. Shafer, D. J. Fixsen, R. E. Eplee, Jr., R. B. Isaacman, S. M. Read, N. W. Boggess, S. Gulkis, M. G. Hauser, M. Janssen, T. Kelsall, P. M. Lubin, S. S. Meyer, S. H. Moseley, Jr., T. L. Murdoch, R. F. Silverberg, G. F. Smoot, R. Weiss, & D. T. Wilkinson. 381, 200, 191-D12 (1991)
- WRIGHT, EDWARD L. On the Long-Wavelength Absorption by Interstellar Dust. Edward L. Wright. 375, 608, 120-C5 (1991)
- The Interstellar  $^{12}$ CN/ $^{13}$ CN Ratio toward  $\zeta$  Persei. Mary Elizabeth Kaiser, Isabel Hawkins, & Edward L. Wright. 379, 267, 166-D1 (1991)
- WRIGHT, G. S. Infrared Emission Regions in the Interacting Galaxy System Arp 299. C. G. Wynn-Williams, S. A. Eales, E. E. Becklin, K.-W. Hodapp, R. D. Joseph, I. S. McLean, D. A. Simons, & G. S. Wright. 377, 426, 145-A13 (1991)
- See CARSWELL, R. F., et al. The Systemic Redshift of the Quasar 1331+170.
- WRIGHT, GILLIAN S. The H $_2$  Line Profiles in the Cygnus Loop: Evidence for J-Shocks with Magnetic Precursors. James R. Graham, Gillian S. Wright, & T. R. Geballe. 372, L21, 79-C7 (1991)
- WRIGHT, M. C. H. NGC 7538 IRS 1: Subarcsecond Resolution Recombination Line and  $^{15}$ NH $_3$  Maser Observations. R. A. Gauvreau, K. J. Johnston, H. A. Nguyen, T. L. Wilson, H. R. Dickel, W. M. Goss, & M. C. H. Wright. 376, 608, 133-G12 (1991)
- WU, X. The Detection of X-Rays from the Hot Interstellar Medium of the Large Magellanic Cloud. Q. Wang, T. Hamilton, D. J. Helfand, & X. Wu. 374, 475, 105-A10 (1991)
- The Intensity and Spectrum of the Diffuse X-Ray Background. X. Wu, T. Hamilton, D. J. Helfand, & Q. Wang. 379, 564, 171-F1 (1991)
- Faint X-Ray Source Counts and the Origin of the X-Ray Background. T. T. Hamilton, D. J. Helfand, & X. Wu. 379, 576, 171-G1 (1991)
- WU, XINJI. The K Parameter and Evolution of the Radio Pulsars. Wen Xu & Xinji Wu. 380, 550, 185-A12 (1991)
- WULSER, JEAN-PIERRE. A Study of Solar Flare Energy Transport Based on Coordinated H $\alpha$  and X-Ray Observations. Richard C. Canfield, Dominic M. Zarro, Jean-Pierre Wulser, & Brian R. Dennis. 367, 671, 21-E11 (1991)
- WYCKOFF, S. N $_2$ H $^+$  in Orion: Chemical Clues to the Dynamics of the Quiescent Gas. M. Womack, L. M. Ziurys, & S. Wyckoff. 370, L99, 59-F1 (1991)
- WYCKOFF, SUSAN. Nitrogen Abundance in Comet Halley. Susan Wyckoff, Stephen C. Tegler, & Lisa Engel. 367, 641, 21-C1 (1991)
- Ammonia Abundances in Four Comets. Susan Wyckoff, Stephen C. Tegler, & Lisa Engel. 368, 279, 26-E5 (1991)
- WYNN-WILLIAMS, C. G. CO (3-2) Mapping and Gas Excitation in the Core of M82. R. P. J. Tilanus, L. J. Tacconi, E. C. Sutton, S. Zhou, D. B. Sanders, C. G. Wynn-Williams, K. Y. Lo, & S. A. Stephens. 376, 500, 132-E13 (1991)
- Infrared Emission Regions in the Interacting Galaxy System Arp 299. C. G. Wynn-Williams, S. A. Eales, E. E. Becklin, K.-W. Hodapp, R. D. Joseph, I. S. McLean, D. A. Simons, & G. S. Wright. 377, 426, 145-A13 (1991)
- WYSE, ROSEMARY F. G. Chemical Evolution with Bursts of Star Formation: Element Ratios in Dwarf Galaxies. Gerard Gilmore & Rosemary F. G. Wyse. 367, L55, 22-C1 (1991)
- Type Ia Supernovae: Constraints on Baryonic Dark Matter. Tammy A. Smecker & Rosemary F. G. Wyse. 372, 448, 81-D1 (1991)
- XIE, TAOLING. A New Method for Analyzing IRAS Data to Determine the Dust Temperature Distribution. Taoling Xie, Paul F. Goldsmith, & Weimin Zhou. 371, L81, 73-D12 (1991)
- XU, CONG. Infrared Emission in Paired Galaxies. II. Luminosity Functions and Far-Infrared Properties. Cong Xu & Jack W. Sulentic. 374, 407, 104-C5 (1991)
- XU, WEN. The K Parameter and Evolution of the Radio Pulsars. Wen Xu & Xinji Wu. 380, 550, 185-A12 (1991)
- XU, YUEMING. Comptonization of Gamma Rays by Cold Electrons. Yueming Xu, Randy R. Ross, & Richard McCray. 371, 280, 63-E11 (1991)
- Energy Degradation of Fast Electrons in Hydrogen Gas. Yueming Xu & Richard McCray. 375, 190, 113-D1 (1991)
- YADAV, J. S. Ionization States of the Anomalous Cosmic Rays. R. K. Singh, Banashree Mitra, N. Durgaprasad, S. Biswas, M. N. Vahia, J. S. Yadav, A. Dutta, & J. N. Goswami. 374, 753, 108-D7 (1991)
- YAHIL, AMOS. A Redshift Survey of IRAS Galaxies. II. Methods for Determining Self-consistent Velocity and Density Fields. Amos

- Yahil, Michael A., Strauss, Marc Davis, & John P. Huchra.** 372, 380, 80-E5 (1991)
- A Redshift Survey of IRAS Galaxies. III. Reconstruction of the Velocity and Density Fields in N-Body Model Universes.** *Marc Davis, Michael A. Strauss, & Amos Yahil.* 372, 394, 80-F7 (1991)
- A Redshift Survey of IRAS Galaxies. II. Methods for Determining Self-consistent Velocity and Density Fields: Erratum.** *Amos Yahil, Michael A. Strauss, Marc Davis, & John P. Huchra.* 381, 348, 193-C10 (1991) (Orig. paper in 372, 380, 80-E5 (1991))
- YAKUSHEV, V. F.** See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- YAMADA, CHIKASHI.** See OHISHI, MASATOSHI, et al. Detection of a New Carbon-Chain Molecule, CCO.
- YAMADA, SHOICHI.** Rayleigh-Taylor Instability in the Asymmetric Supernova Explosion. *Shoichi Yamada & Katsuhiko Sato.* 382, 594, 208-G12 (1991)
- YAMAMOTO, SATOSHI.** Laboratory Observation of the  $^3P_1 - ^3P_0$  Transition of the Neutral Carbon Atom by Submillimeter-Wave Absorption Spectroscopy. *Satoshi Yamamoto & Shuji Saito.* 370, L103, 59-F7 (1991)
- YAMASHITA, TAKUYA.** The Dense, Inner Part of the Protostellar Disk: Protostar Candidates in GGD 27 IRS. *Takuya Yamashita, Yasuhiro Murata, Ryoei Kawabe, Norio Kaifu, & Motohide Tamura.* 373, 560, 95-A1 (1991)
- YANG, JI.** A Millimeter-Wave Line Study of L1287: A Case of Induced Star Formation by Stellar Wind Compression? *Ji Yang, Tomofumi Umemoto, Takahiro Iwata, & Yasuo Fukui.* 373, 137, 87-F7 (1991)
- YANG, STEPHENSON.** HD 50896: Blobs in a Wind with a Collapsed Companion or Rotating Disk with Central Filaments? *Anne B. Underhill & Stephenson Yang.* 368, 588, 32-D9 (1991)
- YANG, W.-H.** Latitudinal Dynamics of Steady Solar Wind Flows. *W.-H. Yang & R. W. Schunk.* 372, 703, 84-D5 (1991)
- YEE, H. K. C.** Quasars and Active Galactic Nuclei in Rich Environments. II. The Evolution of Radio-loud Quasars. *E. Ellingson, H. K. C. Yee, & R. F. Green.* 371, 49, 60-F7 (1991)
- Quasars and Active Galactic Nuclei in Rich Environments. I. Fields Surrounding Optically Faint Quasars. *E. Ellingson, H. K. C. Yee, & R. F. Green.* 76, 455, 31-D2 (1991)
- Infrared and Visible Photometry of the Gravitational Lens System 2237+030. *Daniel Nadeau, H. K. C. Yee, W. J. Forrest, J. D. Garnett, Z. Ninkov, & J. L. Pipher.* 376, 430, 131-G1 (1991)
- Clusters of Galaxies Associated with Quasars. II. Galaxy Cluster Dynamics. *E. Ellingson, R. F. Green, & H. K. C. Yee.* 378, 476, 158-D1 (1991)
- Spatially Resolved Spectroscopy of Lyman-Alpha and C IV in the Gravitational Lens 2237+030. *H. K. C. Yee & M. M. De Robertis.* 381, 386, 195-E1 (1991)
- YELLE, ROGER V.** Non-LTE Models of Titan's Upper Atmosphere. *Roger Yelle.* 383, 380, 217-A10 (1991)
- YEPES, G.** Luminosity Segregation as an Indication of Dynamical Evolution in Rich Clusters of Galaxies. *G. Yepes, R. Dominguez-Tenreiro, & R. del Pozo-Sanz.* 373, 336, 92-B13 (1991)
- YIN, Q. F.** Compact Starbursts in Ultraluminous Infrared Galaxies. *J. J. Condon, Z.-P. Huang, Q. F. Yin, & T. X. Thuan.* 378, 65, 151-G5 (1991)
- YODH, G. B.** See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- YOKOYAMA, JUN'ICHI.** Baryon Isocurvature Scenario in Inflationary Cosmology: A Particle Physics Model and Its Astrophysical Implications. *Jun'ichi Yokoyama & Yasushi Suto.* 379, 427, 170-B1 (1991)
- YORK, D. G.** Predicted Profiles of Ultraviolet Interstellar Absorption Lines. *D. E. Welty, L. M. Hobbs, & D. G. York.* 75, 425, 6-E5 (1991)
- An Ultraviolet Atlas of Quasar and Blazar Spectra. *A. L. Kinney, R. C. Bohlin, J. C. Blades, & D. G. York.* 75, 645, 10-C7 (1991)
- YORK, DONALD G.** Probing the Galactic Halo along the 3C 273 Sight Line Using IUE. *Geoffrey S. Burks, Donald G. York, J. Chris Blades, Ralph C. Bohlin, & Willem Wamsteker.* 381, 55, 189-F5 (1991)
- YOSHIDA, A.** See NAGASE, F., et al. Cyclotron Line Features in the Spectrum of the Transient X-Ray Pulsar X0115+634.
- V/V<sub>max</sub>** Test Applied to Ginga Gamma-Ray Bursts. *Y. Ogasaka, T. Murakami, J. Nishimura, A. Yoshida, & E. E. Fenimore.* 383, L61, 226-D6 (1991)
- YOSHII, YUZURU.** Faint Galaxies: Bounds on the Epoch of Galaxy Formation and the Cosmological Deceleration Parameter. *Yuzuru Yoshii & Bruce A. Peterson.* 372, 8, 74-B6 (1991)
- YOSHINO, K.** High-Resolution Absorption Cross Sections of Carbon Monoxide Bands at 295 K between 91.7 and 100.4 Nanometers. *G. Stark, K. Yoshino, Peter L. Smith, K. Ito, & W. H. Parkinson.* 369, 574, 44-G13 (1991)
- YOSS, KENNETH M.** Metallicity and Velocity Distribution of Giants toward the Galactic Poles. *Kavan U. Ratnatunga & Kenneth M. Yoss.* 377, 442, 145-C3 (1991)
- YOUNG, ARTHUR.** Evidence for External Plasma around the K Dwarf Component of the Eclipsing Binary V471 Tauri. *Arthur Young, Lee Routier, & Andrew Skumanich.* 378, L25, 157-D1 (1991)
- YOUNG, JUDITH S.** The Rate and Efficiency of High-Mass Star Formation along the Hubble Sequence. *Nicholas A. Devereux & Judith S. Young.* 371, 515, 68-A1 (1991)
- Molecular Clouds in Starburst Galaxy Nuclei. *Judith S. Young & Nicholas A. Devereux.* 373, 414, 93-B6 (1991)
- YOUNG, K.** Abundances in Red Giant Stars: Nitrogen Isotopes in Carbon-rich Molecular Envelopes. *P. G. Wannier, B-G Andersson, H. Olofsson, N. Ukitा, & K. Young.* 380, 593, 185-E8 (1991)
- YOUNGER, P. F.** See PETERSON, B. M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths.
- YU, K. N.** Very High Energy Gamma-Ray Emission from Accreting X-Ray Pulsars. *K. S. Cheng, K. N. Yu, T. Cheung, & M. M. Lau.* 379, 290, 166-F1 (1991)
- Simultaneous Correlation Analysis of Combined Gamma-Ray Data. *K. N. Yu.* 382, 647, 209-F1 (1991)
- YUAN, CHI.** Resonance Excitation of Spiral Density Waves in a Gaseous Disk. II. A Nonlinear Theory and Application to the 3 Kiloparsec Arm. *Chi Yuan & Ye Cheng.* 376, 104, 126-C3 (1991)
- YUAN, WENBO.** The Fragmentation of "Pancakes" in a Dark Matter-dominated Universe. *Wenbo Yuan, Joan M. Centrella, & Michael L. Norman.* 376, L29, 137-A11 (1991)
- YUN, JOÃO LIN.** Bok Globules and Small Molecular Clouds: Deep IRAS Photometry and  $^{12}\text{CO}$  Spectroscopy. *Dan P. Clemens, João Lin Yun, & Mark H. Heyer.* 75, 877, 13-E1 (1991)
- Radial Dust Density Profiles in Small Molecular Clouds. *João Lin Yun & Dan P. Clemens.* 381, 474, 196-E7 (1991)
- YUSEF-ZADEH, F.** A Windswept Cometary Tail on the Galactic Center Supergiant IRS 7. *F. Yusef-Zadeh & Mark Morris.* 371, L59, 73-B10 (1991)
- ZABLUDOFF, ANN I.** The Kinematics of Abell Clusters: Erratum. *Ann I. Zabludoff, John P. Huchra, & Margaret J. Geller.* 75, 629, 9-C13 (1991) (Orig. paper in 74, 1, 30-B1 (1990))
- ZAITSEV, V. V.** Consequences of Strong Pitch-Angle Diffusion of Particles in Solar Flares. *P. A. Bespalov, V. V. Zaitsev, & A. V. Stepanov.* 374, 369, 102-F5 (1991)
- ZAKHAROV, A. I.** On the Nature of the Anomalously Slow Apsidal Motion of DI Herculis. *Kh. F. Khalilullin, S. A. Khodykin, & A. I. Zakharov.* 375, 314, 114-G1 (1991)
- ZAMORANI, GIOVANNI.** The Distribution of Clusters of Galaxies within  $300 \text{ Mpc } h^{-1}$  and the Crossover to an Isotropic and Homogeneous Universe. *Roberto Scaramella, Giampaolo Vettolani, & Giovanni Zamorani.* 376, L1, 130-A7 (1991)
- ZAMPieri, LUCA.** Spherical Accretion onto Black Holes: A Complete Analysis of Stationary Solutions. *Luciano Nobili, Roberto Turolla, & Luca Zampieri.* 383, 250, 215-C9 (1991)
- ZANG, T. A.** Dynamics of Solar Coronal Magnetic Fields. *R. B. Dahlburg, S. K. Antiochos, & T. A. Zang.* 383, 420, 217-E1 (1991)
- ZANK, G. P.** The Effect of Viscosity on Steady Transonic Flow with a Nodal Solution Topology. *S. P. Owocki & G. P. Zank.* 368, 491, 31-C1 (1991)
- ZARRO, D. M.** Interrelation of Soft and Hard X-Ray Emissions during Solar Flares. I. Observations. *R. M. Wingate, A. L. Kiplinger, D. M. Zarro, G. A. Dulc, & J. R. Lemen.* 375, 366, 115-D13 (1991)

- ZARRO, DOMINIC M. A Study of Solar Flare Energy Transport Based on Coordinated H<sub>α</sub> and X-Ray Observations. *Richard C. Canfield, Dominic M. Zarro, Jean-Pierre Wülser, & Brian R. Dennis.* 367, 671, 21-E11 (1991)
- Soft X-Ray Emission from Electron-Beam-heated Solar Flares. *John T. Mariska & Dominic M. Zarro.* 381, 572, 197-F10 (1991)
- ZATSEPIN, G. T. See AGLIETTA, M., et al. Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.
- ZDZIARSKI, ANDRZEJ A. Bursts of Gamma Rays from Compton Scattering at Cosmological Distances. *Andrzej A. Zdziarski, Roland Svensson, & Bohdan Paczyński.* 366, 343, 7-B3 (1991)
- Variable Soft X-Ray Excesses in Active Galactic Nuclei from Nonthermal Electron-Positron Pair Cascades. *Andrzej A. Zdziarski & Paolo S. Coppi.* 376, 480, 132-D5 (1991)
- ZEILINGER, W. W. Triaxiality in Disk Galaxies. *F. Bertola, M. Vietri, & W. W. Zeilinger.* 374, L13, 103-D1 (1991)
- ZELL, PHILIP J. Circular Polarization in 1612 MHz OH Maser Emission from OH/IR Stars. *Philip J. Zell & John D. Fix.* 369, 506, 44-A9 (1991)
- ZENG, NING. Voids in a Neutrino-dominated Universe. *Ning Zeng & Simon D. M. White.* 374, 1, 98-B1 (1991)
- ZENSUS, J. A. See QUIRRENBACH, A., et al. Correlated Radio and Optical Variability in the BL Lacertae Object 0716+714.
- ZEPP, STEPHEN E. Optical Colors of Early-Type Galaxies in Compact Groups. *Stephen E. Zepf, Bradley C. Whitmore, & Harold F. Levison.* 383, 524, 220-G1 (1991)
- Modeling the Evolution of Galaxies in Compact Groups. *Stephen E. Zepf & Bradley C. Whitmore.* 383, 542, 221-A8 (1991)
- ZERNER, MICHAEL C. Theoretical Studies of the Absorption Spectra of Polycyclic Aromatic Hydrocarbons. *Sylvio Canuto, Michael C. Zerner, & Geerd H. F. Diercksen.* 377, 150, 139-G3 (1991)
- ZHANG, ERHO. V795 Herculis (=PG 1711+336). A Peculiar Intermediate Polar without Strong X-Ray Emission. *Erho Zhang, Edward L. Robinson, Tod F. Ramseyer, Mathew D. Shetrone, & Rae F. Stiening.* 381, 534, 197-C10 (1991)
- ZHANG, J. Limits on the Density of Neutral Gas within 100 Parsecs from Observations of the Soft X-Ray Background. *M. Juda, J. J. Bloch, B. C. Edwards, D. McCammon, W. T. Sanders, S. L. Snowden, & J. Zhang.* 367, 182, 14-C8 (1991)
- ZHANG, Q. Sticking Probability of H and D Atoms on Amorphous Ice: A Computational Study. *V. Buch & Q. Zhang.* 379, 647, 172-F7 (1991)
- ZHANG, W. P. See ALEXANDREAS, D. E., et al. A Search of the Northern Sky for Ultra-High-Energy Point Sources.
- ZHANG, YUN FEI. Multifrequency VLA, VLBI, and Single-Dish Observations of the Quasar 4C 39.25. *Alan P. Marscher, Yun Fei Zhang, David B. Shaffer, Hugh D. Aller, & Margo F. Aller.* 371, 491, 67-E12 (1991)
- ZHENG, WEI. Unique Broad-Line Profile Variations in the Radio Galaxy 3C 390.3. *Sylvain Veilleux & Wei Zheng.* 377, 89, 139-B7 (1991)
- 3C 390.3: Modeling Variable Profile Humps. *Wei Zheng, Sylvain Veilleux, & Steven A. Grandi.* 381, 418, 196-A1 (1991)
- Fe II Emission and Anisotropy in Broad-Line Regions. *Wei Zheng & William C. Keel.* 382, 121, 201-F5 (1991)
- Inference of the Extreme-Ultraviolet Continuum Shape of Quasars. *Wei Zheng.* 382, L55, 211-A11 (1991)
- ZHOU, S. CO (3-2) Mapping and Gas Excitation in the Core of M82. *R. P. J. Tilanus, L. J. Tacconi, E. C. Sutton, S. Zhou, D. B. Sanders, C. G. Wynn-Williams, K. Y. Lo, & S. A. Stephens.* 376, 500, 132-E13 (1991)
- ZHOU, SHUDONG. CS Multitransitional Studies of Density Distribution in Star-forming Regions. I. The NGC 2071 Region. *Shudong Zhou, Neal J. Evans II, Rolf Güsten, Lee G. Mundy, & Marc L. Kutner.* 372, 518, 82-C1 (1991)
- ZHOU, WEIMIN. A New Method for Analyzing IRAS Data to Determine the Dust Temperature Distribution. *Taoting Xie, Paul F. Goldsmith, & Weimin Zhou.* 371, L81, 73-D12 (1991)
- ZHU, YUDONG. Infrared Polarimetry of Quasars. *Michael L. Sitko & Yudong Zhu.* 369, 106, 37-C5 (1991)
- ZHURAVLEV, D. A. See ADAMS, J. H., JR., et al. The Charge State of the Anomalous Component of Cosmic Rays.
- ZINK, L. R. Far-Infrared Fourier Transform Spectroscopy of <sup>12</sup>C<sup>18</sup>O. *P. De Natale, M. Inguscio, C. Rois Orza, & L. R. Zink.* 370, L53, 53-G5 (1991)
- ZINK, LYNDON R. Atomic Oxygen Fine-Structure Splittings with Tunable Far-Infrared Spectroscopy. *Lyndon R. Zink, Kenneth M. Evenson, Fusakazu Matsushima, Thomas Nelis, & Ruth L. Robinson.* 371, L85, 73-E3 (1991)
- ZINNECKER, H. The Molecular Interstellar Medium and the Near-Infrared Continuum of the Barred LINER NGC 6764. *A. Eckart, M. Cameron, J. M. Jackson, R. Genzel, A. I. Harris, W. Wild, & H. Zinnecker.* 372, 67, 74-G9 (1991)
- ZINNER, ERNST. <sup>26</sup>Al and <sup>16</sup>O in the Early Solar System: Clues from Meteorite Al<sub>2</sub>O<sub>3</sub>. *Edward Anders, Alois Virág, Ernst Zinner, & Roy S. Lewis.* 373, L77, 97-F6 (1991)
- s-Process Ba, Nd, and Sm in Presolar SiC from the Murchison Meteorite. *Ernst Zinner, Sachiko Amari, & Roy S. Lewis.* 382, L47, 205-E11 (1991)
- ZINNER, ERNST K. Interstellar Grains within Interstellar Grains. *Thomas J. Bernatowicz, Sachiko Amari, Ernst K. Zinner, & Roy S. Lewis.* 373, L73, 97-E10 (1991)
- Isotopically Anomalous Ti in Presolar SiC from the Murchison Meteorite. *Trevor R. Ireland, Ernst K. Zinner, & Sachiko Amari.* 376, L53, 137-D7 (1991)
- ZIRIN, H. The Microwave Brightness Temperature Spectrum of the Quiet Sun. *H. Zirin, B. M. Baumert, & G. J. Hurford.* 370, 779, 58-B12 (1991)
- ZIRIN, HAROLD. Motions, Fields, and Flares in the 1989 March Active Region. *Haimin Wang, Frances Tang, Harold Zirin, & Guoxiang Ai.* 380, 282, 179-E1 (1991)
- ZIURYS, L. M. N<sub>2</sub>H<sup>+</sup> in Orion: Chemical Clues to the Dynamics of the Quiescent Gas. *M. Womack, L. M. Ziurys, & S. Wyckoff.* 370, L99, 59-F1 (1991)
- Nitric Oxide in Star-forming Regions: Further Evidence for Interstellar N-O Bonds. *L. M. Ziurys, D. McGonagle, Y. Minh, & W. M. Irvine.* 373, 535, 94-E11 (1991)
- SiS in Outflow Regions: More High-Temperature Silicon Chemistry. *L. M. Ziurys.* 379, 260, 166-C7 (1991)
- ZUCKERMAN, B. Spatial Studies of Planetary Nebulae with IRAS. *G. W. Hawkins & B. Zuckerman.* 374, 227, 100-G11 (1991)
- The Infrared and Optical Pulsations of G29-38. *Joseph Patterson, B. Zuckerman, E. E. Becklin, D. J. Tholen, & T. Hawarden.* 374, 330, 102-C1 (1991)
- ZUREK, W. H. Radiation-induced Reversal of Baryonic Perturbations. *W. H. Zurek.* 370, 474, 54-C8 (1991)
- ZWAAN, CORNELIS. See DUNCAN, DOUGLAS K., et al. Ca II H and K Measurements Made at Mount Wilson Observatory, 1966-1983.
- ZWEIBEL, ELLEN G. Expansion of a Superbubble in a Uniform Magnetic Field. *Katia M. Ferrière, Mordecai-Mark Mac Low, & Ellen G. Zweibel.* 375, 239, 114-A4 (1991)
- Evolution to Nonequilibrium in Simple Models of Prominence Filaments. *Ellen G. Zweibel.* 376, 761, 135-G1 (1991)
- Cosmic-Ray Heating of Cooling Flows: A Critical Analysis. *Michael Loewenstein, Ellen G. Zweibel, & Mitchell C. Begelman.* 377, 392, 144-F4 (1991)
- Magnetized Supernova Remnants with Cosmic Rays. *Katia M. Ferrière & Ellen G. Zweibel.* 383, 602, 221-F11 (1991)
- ZYLSTRA, GREGORY J. Flux-limited Diffusion in a Scattering Medium. *Fulvio Melia & Gregory J. Zylstra.* 374, 732, 108-B9 (1991)
- Radiative-hydrodynamical Simulations of Accretion Disk Coronae. *Fulvio Melia, Gregory J. Zylstra, & Bruce Fryxell.* 377, L101, 150-E11 (1991)

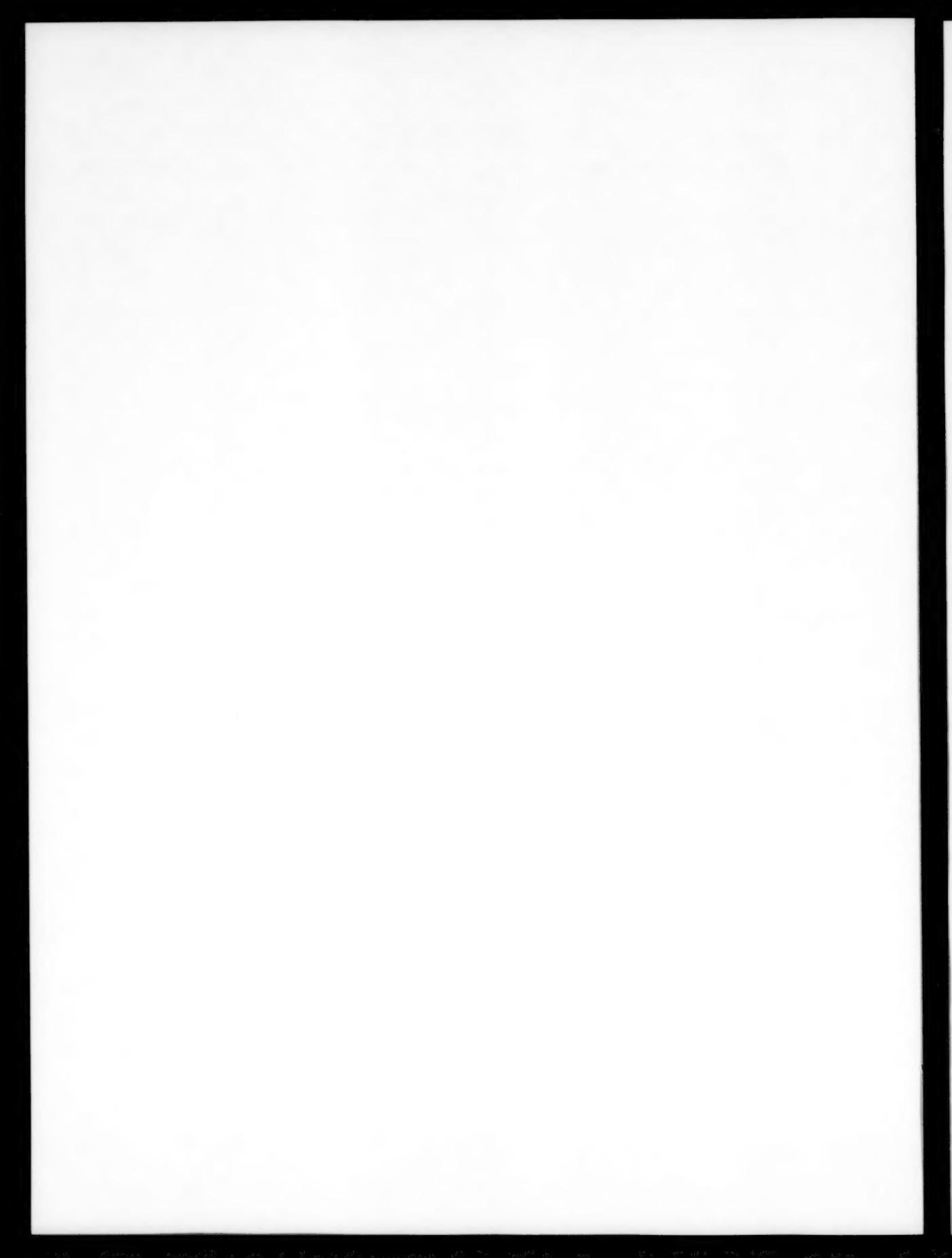


## SUBJECT HEADING TABLE OF CONTENTS

Abundances . . . . .	123	Galaxies: Magellanic Clouds . . . . .	147
Accretion . . . . .	123	Galaxies: Nuclei . . . . .	148
Analytical Methods . . . . .	123	Galaxies: Photometry . . . . .	150
Asteroids . . . . .	124	Galaxies: Redshifts . . . . .	151
Astrometry . . . . .	124	Galaxies: Seyfert . . . . .	151
Atomic Processes . . . . .	124	Galaxies: Stellar Content . . . . .	153
Black Holes . . . . .	124	Galaxies: Structure . . . . .	153
BL Lacertae Objects . . . . .	125	Galaxies: The Galaxy . . . . .	155
Ca II Emission . . . . .	126	Galaxies: X-Rays . . . . .	156
Clusters: Associations . . . . .	126	Gamma Rays: Bursts . . . . .	157
Clusters: Dynamics . . . . .	126	Gamma Rays: General . . . . .	157
Clusters: Globular . . . . .	126	Gravitation . . . . .	159
Clusters: Open . . . . .	127	Gravitational Lenses . . . . .	159
Comets . . . . .	127	High-Latitude Objects . . . . .	160
Convection . . . . .	127	Hydrodynamics . . . . .	160
Cosmic Background Radiation . . . . .	128	Hydromagnetics . . . . .	161
Cosmic Rays: Abundances . . . . .	128	Hyperfine Structure . . . . .	162
Cosmic Rays: General . . . . .	129	Image Processing . . . . .	162
Cosmology . . . . .	129	Infrared: General . . . . .	162
Dark Matter . . . . .	132	Infrared: Sources . . . . .	162
Dense Matter . . . . .	133	Infrared: Spectra . . . . .	164
Deuterium . . . . .	133	Instabilities . . . . .	166
Diffusion . . . . .	133	Instruments . . . . .	166
Early Universe . . . . .	133	Interferometry . . . . .	166
Earth: Atmosphere . . . . .	134	Intergalactic Medium . . . . .	167
Earth: General . . . . .	134	Interplanetary Medium . . . . .	167
Editorials and Notices . . . . .	134	Interstellar: Abundances . . . . .	167
Elementary Particles . . . . .	134	Interstellar: Grains . . . . .	168
Equation of State . . . . .	134	Interstellar: Magnetic Fields . . . . .	169
Errata, Addenda, and Corrigenda . . . . .	134	Interstellar: Matter . . . . .	169
Fundamental Constants . . . . .	135	Interstellar: Molecules . . . . .	171
Galaxies: Abundances . . . . .	135	Laboratory Spectra . . . . .	173
Galaxies: Clustering . . . . .	135	Line Formation . . . . .	174
Galaxies: Distances . . . . .	138	Line Identifications . . . . .	174
Galaxies: Evolution . . . . .	138	Line Profiles . . . . .	174
Galaxies: Formation . . . . .	139	Luminosity Function . . . . .	175
Galaxies: General . . . . .	139	Magnetic Fields . . . . .	176
Galaxies: Individual		Masers . . . . .	176
By Messier Number . . . . .	140	Mass-Luminosity Relation . . . . .	176
By NGC Number . . . . .	140	Meteors and Meteorites . . . . .	176
By Name . . . . .	142	Molecular Processes . . . . .	176
By Alphanumeric Designation . . . . .	142	Moon . . . . .	177
Galaxies: Interactions . . . . .	143	Nebulae: Abundances . . . . .	177
Galaxies: Intergalactic Medium . . . . .	144	Nebulae: Crab Nebula . . . . .	178
Galaxies: Internal Motions . . . . .	144	Nebulae: General . . . . .	178
Galaxies: Interstellar Matter . . . . .	145	Nebulae: H II Regions . . . . .	178
Galaxies: Jets . . . . .	147	Nebulae: Individual	
Galaxies: Local Group . . . . .	147	By Messier Number . . . . .	179

By NGC Number . . . . .	179	Stars: Abundances . . . . .	201
By Name . . . . .	180	Stars: Accretion . . . . .	203
By Alphanumeric Designation . . . . .	181	Stars: Atmospheres . . . . .	204
Nebulae: Internal Motions . . . . .	182	Stars: Ba II . . . . .	204
Nebulae: Orion Nebula . . . . .	183	Stars: Be . . . . .	204
Nebulae: Planetary . . . . .	183	Stars: Binaries . . . . .	204
Nebulae: Reflection . . . . .	184	Stars: Brown Dwarfs . . . . .	206
Nebulae: Structure . . . . .	184	Stars: Carbon . . . . .	206
Nebulae: Supernova Remnants . . . . .	184	Stars: Catalogs . . . . .	206
Neutrinos . . . . .	185	Stars: Cepheids . . . . .	206
Nuclear Reactions . . . . .	185	Stars: Chromospheres . . . . .	206
Nucleosynthesis . . . . .	186	Stars: Circumstellar Shells . . . . .	206
Numerical Methods . . . . .	186	Stars: Collapsed . . . . .	208
Occultations . . . . .	187	Stars: Coronae . . . . .	208
Opacities . . . . .	187	Stars: R Coronae Borealis . . . . .	208
Particle Acceleration . . . . .	187	Stars: Diameters . . . . .	208
Photometry . . . . .	188	Stars: Dwarf Novae . . . . .	208
Planets: Abundances . . . . .	188	Stars: Early-Type . . . . .	208
Planets: Atmospheres . . . . .	188	Stars: Eclipsing Binaries . . . . .	209
Planets: Charged Particles . . . . .	188	Stars: Emission-Line . . . . .	209
Planets: Formation . . . . .	188	Stars: Evolution . . . . .	209
Planets: General . . . . .	189	Stars: Faint Blue . . . . .	210
Planets: Interiors . . . . .	189	Stars: Flare . . . . .	210
Planets: Jupiter . . . . .	189	Stars: Formation . . . . .	211
Planets: Magnetospheres . . . . .	189	Stars: U Geminorum . . . . .	212
Planets: Mars . . . . .	189	Stars: High-Velocity . . . . .	212
Planets: Neptune . . . . .	189	Stars: Horizontal-Branch . . . . .	212
Planets: Pluto . . . . .	189	Stars: Individual . . . . .	
Planets: Satellites . . . . .	189	By Constellation Name . . . . .	212
Planets: Saturn . . . . .	189	By Bright Star Number . . . . .	215
Planets: Spectra . . . . .	189	By Henry Draper Number . . . . .	215
Planets: Venus . . . . .	189	By Name . . . . .	215
Plasmas . . . . .	189	By Alphanumeric Designation . . . . .	216
Polarization . . . . .	190	Stars: Interiors . . . . .	217
Pulsars . . . . .	191	Stars: Late-Type . . . . .	218
Quantum Mechanics . . . . .	192	Stars: Long-Period Variables . . . . .	219
Quasars . . . . .	192	Stars: Low-Mass . . . . .	219
Radar Astronomy . . . . .	194	Stars: Luminosities . . . . .	219
Radial Velocities . . . . .	194	Stars: RR Lyrae . . . . .	219
Radiation Mechanisms . . . . .	194	Stars: Magnetic . . . . .	220
Radiative Transfer . . . . .	196	Stars: Mass Loss . . . . .	220
Radio Sources: Extended . . . . .	197	Stars: Massive . . . . .	221
Radio Sources: Galaxies . . . . .	197	Stars: Metallic-Line . . . . .	221
Radio Sources: General . . . . .	197	Stars: Neutron . . . . .	221
Radio Sources: Identifications . . . . .	198	Stars: Novae . . . . .	222
Radio Sources: Lines . . . . .	198	Stars: Of-Type . . . . .	223
Radio Sources: Spectra . . . . .	198	Stars: Peculiar A . . . . .	223
Radio Sources: 21 cm Radiation . . . . .	198	Stars: Planetary Systems . . . . .	223
Radio Sources: Variable . . . . .	199	Stars: Population II . . . . .	223
Relativity . . . . .	199	Stars: Pre-Main-Sequence . . . . .	223
Rotation . . . . .	200	Stars: Proper-Motion . . . . .	224
Shock Waves . . . . .	200	Stars: Pulsation . . . . .	224
Sky Photographs . . . . .	201	Stars: Radio Radiation . . . . .	225
Solar System: General . . . . .	201	Stars: Rotation . . . . .	225
Spectrophotometry . . . . .	201	Stars: Semiregular Variables . . . . .	225

Stars: Spectra . . . . .	225	Sun: Granulation . . . . .	233
Stars: Spectral Classification . . . . .	225	Sun: Interior . . . . .	234
Stars: Stellar Dynamics . . . . .	225	Sun: Limb Darkening . . . . .	234
Stars: Stellar Statistics . . . . .	226	Sun: Magnetic Fields . . . . .	234
Stars: S-Type . . . . .	226	Sun: Oscillations . . . . .	235
Stars: Subdwarfs . . . . .	226	Sun: Particle Emission . . . . .	235
Stars: Supergiants . . . . .	226	Sun: Plages . . . . .	235
Stars: Supernovae . . . . .	226	Sun: Prominences . . . . .	236
Stars: Symbiotic . . . . .	227	Sun: Radio Radiation . . . . .	236
Stars: RV Tauri . . . . .	228	Sun: Rotation . . . . .	236
Stars: Variables . . . . .	228	Sun: Solar Wind . . . . .	236
Stars: Visual Multiples . . . . .	228	Sun: Spectra . . . . .	236
Stars: W Ursae Majoris . . . . .	228	Sun: Sunspots . . . . .	237
Stars: Weak-Line . . . . .	228	Sun: Transition Region . . . . .	237
Stars: White Dwarfs . . . . .	228	Sun: X-Rays . . . . .	237
Stars: Winds . . . . .	229	Transition Probabilities . . . . .	238
Stars: Wolf-Rayet . . . . .	230	Transition Rates . . . . .	238
Stars: X-Rays . . . . .	230	Turbulence . . . . .	238
Sun: Abundances . . . . .	230	Ultraviolet: General . . . . .	238
Sun: Activity . . . . .	231	Ultraviolet: Spectra . . . . .	238
Sun: Atmosphere . . . . .	231	Wave Motions . . . . .	241
Sun: Atmospheric Motions . . . . .	231	X-Rays: Binaries . . . . .	241
Sun: Chromosphere . . . . .	231	X-Rays: Bursts . . . . .	243
Sun: Corona . . . . .	232	X-Rays: General . . . . .	243
Sun: Eclipses . . . . .	232	X-Rays: Sources . . . . .	243
Sun: Faculae . . . . .	233	X-Rays: Spectra . . . . .	244
Sun: Flares . . . . .	233	Zeeman Effect . . . . .	245
Sun: General . . . . .	233	Zodiacal Light . . . . .	245



## 1991 SUBJECT INDEX

### ABUNDANCES

- Abundances in H II Regions at the Edge of the Galaxy. *Michel Fich & Mariabeth Silkey.* 366, 107, 2-D1 (1991)
- The Metal Abundance and Specific Energy of Intracluster Gas. *Raymond E. White III.* 367, 69, 12-G8 (1991)
- Detection of  $^{13}\text{C}$  Isotopomers of  $\text{HC}_5\text{N}$  ( $J = 9-8$ ) in the Circumstellar Envelope of IRC +10216. *M. B. Bell & P. A. Feldman.* 367, L33, 17-E8 (1991)
- Nitrogen Abundance in Comet Halley. *Susan Wyckoff, Stephen C. Tegler, & Lisa Engel.* 367, 641, 21-C1 (1991)
- Ammonia Abundances in Four Comets. *Susan Wyckoff, Stephen C. Tegler, & Lisa Engel.* 368, 279, 26-E5 (1991)
- Lithium, Age, and Metallicity in Open Clusters. *Ann Merchant Boesgaard.* 370, L95, 59-E12 (1991)
- $\text{N}_2\text{H}^+$  in Orion: Chemical Clues to the Dynamics of the Quiescent Gas. *M. Womack, L. M. Ziurys, & S. Wyckoff.* 370, L99, 59-F1 (1991)
- Primordial  $^4\text{He}$  as a Test of Big Bang Nucleosynthesis. *G. M. Fuller, R. N. Boyd, & J. D. Kalen.* 371, L11, 66-B7 (1991)
- Gas and Dust Production by Comet P/Halley (1910 II). *Ellen S. Howell, Barry L. Lutz, & V. M. Slipher.* 371, 776, 71-B11 (1991)
- Signatures of Inhomogeneity in the Early Universe. *Lawrence H. Kawano, William A. Fowler, Ralph W. Kavanagh, & Robert A. Malany.* 372, 1, 74-A11 (1991)
- Densities and Abundances of Hot Cometary Ions in the Coma of P/Halley. *M. Neugebauer, R. Goldstein, B. E. Goldstein, S. A. Fuselier, H. Balsiger, & W.-H. Ip.* 372, 291, 77-E6 (1991)
- A New Site for the Astrophysical Gamma-Process. *W. Michael Howard, Bradley S. Meyer, & S. E. Woosley.* 373, L5, 91-B1 (1991)
- Interstellar Grains within Interstellar Grains. *Thomas J. Bernatowicz, Sachiko Amari, Ernst K. Zinner, & Roy S. Lewis.* 373, L73, 97-E10 (1991)
- Chemical Abundances in Planetary Nebulae: Basic Data and Correlations between Elements. *M. Perinotto.* 76, 687, 34-C9 (1991)
- Capture Cross Section Measurements of Krypton and Xenon Isotopes and the Fundamental Parameters of the  $s$ -Process. *Hermann Beer.* 375, 823, 122-G7 (1991)
- Primordial Nucleosynthesis Redux. *Terry P. Walker, Gary Steigman, David N. Schramm, Keith A. Olive, & Ho-Shik Kang.* 376, 51, 125-F1 (1991)
- Isotopically Anomalous Ti in Presolar SiC from the Murchison Meteorite. *Trevor R. Ireland, Ernst K. Zinner, & Sachiko Amari.* 376, L53, 137-D7 (1991)
- Large Molecule Production by Mass-losing Carbon Stars: The Primary Source of Interstellar Polycyclic Aromatic Hydrocarbons? *William B. Latter.* 377, 187, 140-C5 (1991)
- Sulfur-bearing Ions in the Ionosphere of Comet Halley. *M. L. Marconi, D. A. Mendis, D. L. Mitchell, R. P. Lin, A. Korth, & H. Réme.* 378, 756, 161-F7 (1991)
- The Carbon Abundance of the Lyman-Alpha Clouds. *Limin Lu.* 379, 99, 164-C1 (1991)
- An Analytical Formulation of the Double-Pulse  $s$ -Process Model. *Hermann Beer.* 379, 409, 168-B1 (1991)
- Enrichment and Heating of the Intracluster Medium through Galactic Winds. *L. P. David, W. Forman, & C. Jones.* 380, 39, 176-E1 (1991)
- The Upper Bound to the Primordial Abundance of Helium and the Consistency of the Hot Big Bang Model. *Keith A. Olive, Gary Steigman, & Terry P. Walker.* 380, L1, 181-B1 (1991)
- Detection of Interstellar  $\text{H}_3\text{O}^+$ : A Confirming Line. *Alwyn Wootten, J. G. Mangum, B. E. Turner, M. Boley, F. Boulanger, F. Combès, P. J. Encrernaz, & M. Gerin.* 380, L79, 188-E6 (1991)
- $s$ -Process Ba, Nd, and Sm in Presolar SiC from the Murchison Meteorite. *Ernst Zinner, Sachiko Amari, & Roy S. Lewis.* 382, L47, 205-E11 (1991)
- Oxygen Abundances in Halo Stars. *Michael S. Bessell, Ralph S. Sutherland, & Kui Ruan.* 383, L71, 226-E6 (1991)

### ACCRETION

- Nonaxisymmetric Instabilities in Rotating Shear Flows: Internal Gravity Modes in Stratified Media and Analogies with Plane Flows. *P. Ghosh & M. A. Abramowicz.* 366, 221, 3-F13 (1991)
- Structure of Thermal Pair Clouds around Gamma-Ray-emitting Black Holes. *Edison P. Liang.* 367, 470, 19-C1 (1991)
- Two-Temperature Accretion Disks with Winds in a Fluid Approximation. *Masaaki Kusunose.* 370, 505, 54-F1 (1991)
- Does Accretion Cease When a Star Approaches Breakup? *Robert Popham & Ramesh Narayan.* 370, 604, 56-A6 (1991)
- The Effect of Anisotropic Emission from Thick Accretion Disks on the Luminosity Functions of Active Galactic Nuclei. *C. M. Urry, P. Marziani, & M. Calvani.* 371, 510, 67-G7 (1991)
- A Recipe for Making Hot Accretion Disks. *Gunnlaugur Björnsson & Roland Svensson.* 371, L69, 73-C10 (1991)
- Evolution of the Luminosity Function of Quasar Accretion Disks. *David M. Cadiz, Vahé Petrosian, & Amri Wandelt.* 372, L63, 85-C1 (1991)
- Hard X-Ray Spectra from Gap Accretion onto Neutron Stars. *Włodzimierz Kluźniak & James R. Wilson.* 372, L87, 85-E1 (1991)
- Diffusion and Mixing in Classical Nova Precursors. *Icko Iben, Jr., Masayuki Y. Fujimoto, & Jim MacDonald.* 375, L27, 117-D1 (1991)
- Line Profiles from a Disk around a Rotating Black Hole. *Ari Laor.* 376, 90, 126-B1 (1991)
- A Powerful Local Shear Instability in Weakly Magnetized Disks. I. Linear Analysis. *Steven A. Balbus & John F. Hawley.* 376, 214, 127-E11 (1991)
- Luminosity Limit for Alpha-Viscosity Accretion Disks. *Edison P. Liang & Amri Wandelt.* 376, 746, 135-E8 (1991)
- Nonlinear Instability of the Accretion Line. *Noam Soker.* 376, 750, 135-F1 (1991)
- Isothermal, Compton-heated Coronae above Accretion Disks. *Eve C. Ostriker, Christopher F. McKee, & Richard I. Klein.* 377, 593, 147-B3 (1991)
- Turbulence, Convection, and Stability in Accretion Disks. *César Meirelles Filho.* 378, 266, 154-C4 (1991)
- The Visual Wavelength Continuum of Quasars: A Reexamination. *W. A. Stein.* 379, 107, 164-C11 (1991)
- Modeling an Accretion Disk in NGC 985. *R. M. Stanga, J. M. Rodriguez Espinosa, & F. Mannucci.* 379, 592, 172-A9 (1991)
- Hybrid Accretion Disks in Active Galactic Nuclei. I. Structure and Spectra. *Amri Wandelt & Edison P. Liang.* 380, 84, 177-B1 (1991)
- Pair-Density Transitions in Accretion Disk Coronae. *Masaaki Kusunose & Shin Mineshige.* 381, 490, 196-G1 (1991)
- Polarization Properties of Emission Lines from Relativistic Accretion Disks. *Kaiyao Chen & Douglas M. Eardley.* 382, 125, 201-F10 (1991)
- IRAS 02366-3101: An Accretion Disk Candidate among Luminous IRAS Galaxies. *Luis Colina, Sebastian Lipari, & F. Macchietto.* 382, L63, 211-B7 (1991)
- Spherical Accretion onto Black Holes: A Complete Analysis of Stationary Solutions. *Luciano Nobili, Roberto Turolla, & Luca Zampieri.* 383, 250, 215-C9 (1991)
- ### ANALYTICAL METHODS
- The Imaging Performance of the *Hubble Space Telescope*. *Christopher J. Burrows, Jon A. Holtzman, S. M. Faber, Pierre Y. Béty, Hashima Hasan, C. R. Lynds, & Daniel Schroeder.* 369, L21, 45-C1 (1991)
- Tomographic Separation of Composite Spectra: The Components of the O-Star Spectroscopic Binary AO Cassiopeiae. *William G. Bagnuolo, Jr., & Douglas R. Gies.* 376, 266, 128-C1 (1991)
- Primordial Nucleosynthesis without a Computer. *Rahim Esmailzadeh, Glenn D. Starkman, & Savas Dimopoulos.* 378, 504, 158-F7 (1991)
- Periodic Stellar Pulsations: Stability Analysis and Amplitude Equations. *J. Robert Buchler, Paweł Moskalik, & Géza Kovács.* 380, 185, 178-D1 (1991)

Precollapse Scale Invariance in Gravitational Instability. *F. Moutarde, J.-M. Alimi, F. R. Bouchet, R. Pella, & A. Ramani.* 382, 377, 206-C5 (1991)

#### ASTEROIDS

Observation of a Rapid Decrease in the Brightness of the Coma of 2060 Chiron in 1990 January. *Bonnie J. Buratti & R. Scott Dunbar.* 366, L47, 6-F1 (1991)

Light-Curve Inversion Formalism. *Walter J. Wild.* 368, 622, 32-G9 (1991)

#### ASTROMETRY

High-Precision Timing of Millisecond Pulsars. I. Astrometry and Masses of the PSR 1855+09 System. *M. F. Ryba & J. H. Taylor.* 371, 739, 70-F9 (1991)

Binary Star Observations with the *Hubble Space Telescope* Fine Guidance Sensors. I. ADS 11300. *O. G. Franz, T. J. N. Kreidl, L. W. Wasserman, A. J. Bradley, G. F. Benedict, P. D. Hemenway, W. H. Jefferys, B. McArthur, J. E. McCartney, E. Nelson, P. J. Shelin, D. Story, A. L. Whipple, R. L. Duncombe, L. W. Fredrick, & Wm. F. van Altena.* 377, L17, 143-C6 (1991)

Multichannel Astrometric Photometer-based Parallaxes of Evolved Stars  $\alpha$  Cygni, 51 Andromedae, and OP Andromedae. *John W. Stein.* 377, 669, 148-A5 (1991)

High-Precision Timing of Millisecond Pulsars. II. Astrometry, Orbital Evolution, and Eclipses of PSR 1957+20. *M. F. Ryba & J. H. Taylor.* 380, 557, 185-B7 (1991)

The Radio "Lobes" of Scorpius X-1 Are Unrelated Background Sources. *E. B. Fomalont & B. J. Geldzahler.* 383, 289, 215-G1 (1991)

#### ATOMIC PROCESSES

Relative Populations for Levels in the  $3d^2$  Ground Configuration of Fe VII. *F. P. Keenan & P. H. Norrington.* 368, 486, 31-B7 (1991)

Collisional Excitation and Radiative Properties of N II: The Strong Intercombination ( $^1D-^3P$ ) Transition at 748 Å. *T. M. Tripp, D. E. Shemansky, G. K. James, & J. M. Ajello.* 368, 641, 33-B6 (1991)

Nitrogen Recombination Lines and Abundance in Nova Shells. *Vladimir Escalante & Alexander Dalgarno.* 369, 213, 38-E7 (1991)

Fe XII Line Ratios in Solar Flares. *S. S. Tayal, Ronald J. W. Henry, F. P. Keenan, S. M. McCann, & K. G. Widing.* 369, 567, 44-G1 (1991)

Laboratory Observation of the  $^3P_1-^3P_0$  Transition of the Neutral Carbon Atom by Submillimeter-Wave Absorption Spectroscopy. *Satoshi Yamamoto & Shuji Saito.* 370, L103, 59-F7 (1991)

Recalculation of Radial Matrix Integrals for the Electric Dipole Transitions in Hydrogen. *G. P. Malik, Usha Malik, & Vijaya S. Varma.* 371, 418, 65-D1 (1991)

Cross Sections for Production of H( $2p, 2s, 1s$ ) by Electron Collisional Dissociation of H<sub>2</sub>. *J. M. Ajello, D. E. Shemansky, & G. K. James.* 371, 422, 65-D5 (1991)

Ne V in Planetary Nebulae. *F. P. Keenan, V. M. Burke, & K. M. Aggarwal.* 371, 636, 69-D13 (1991)

The Energies and Structure of X-Ray K-Absorption Edges. *Robert J. Gould & Young-Dae Jung.* 373, 271, 89-D1 (1991)

Accurate Collision Integrals for the Attractive Static Screened Coulomb Potential with Application to Electrical Conductivity. *James MacDonald.* 76, 369, 29-F3 (1991)

Bowen Fluorescence in AM Herculis Stars. *Jonathan Schachter, Alexei V. Filippenko, Steven M. Kahn, & Frits B. S. Paerels.* 373, 633, 95-G4 (1991)

Ultraviolet High-Excitation Fe II Fluorescence Lines Excited by O VI, C IV, and H I Resonance Emission As Seen in IUE Spectra. *Walter A. Feibelman, Frederick C. Bruhweiler, & Sveneric Johansson.* 373, 649, 96-A8 (1991)

Fe XIV Line Ratios in the Sun. *F. P. Keenan, P. L. Dufton, M. B. Boylan, A. E. Kingston, & K. G. Widing.* 373, 695, 96-E13 (1991)

Large-Scale [C II] 158 Micron Emission from the Galaxy. *Hiroshi Shibai, Haruyuki Okuda, Takao Nakagawa, Hideo Matsuhara, Toshinori Maihara, Kohei Mizutani, Yukiyasu Kobayashi, Norihisa Hiromoto, Tetsuo Nishimura, & Frank J. Low.* 374, 522, 105-F1 (1991)

Roseland and Planck Mean Opacities of a Zero-Metallicity Gas. *Paolo Lanzani, David F. Chernoff, & Edwin E. Salpeter.* 76, 759, 35-B13 (1991)

Energy Degradation of Fast Electrons in Hydrogen Gas. *Yueming Xu & Richard McCray.* 375, 190, 113-D1 (1991)

Near-Infrared Emission of Neutral Carbon from Photon-dominated Regions. *V. Escalante, A. Sternberg, & A. Dalgarno.* 375, 630, 120-E1 (1991)

Accurate Oscillator Strengths of Astrophysical Interest for Neutral Oxygen. *E. Biémont, A. Hibbert, M. Godefroid, N. Vaeck, & B. C. Fawcett.* 375, 818, 122-G1 (1991)

A Critical Assessment of Electron Excitation between the  $2s^22p^2$  and  $2s2p^3$  Configurations of Mg<sup>+6</sup>. *A. Burgess, H. E. Mason, & J. A. Tully.* 376, 803, 136-D1 (1991)

Energy Deposition by X-Ray Photoelectrons into Interstellar Molecular Clouds. *G. Mark Voit.* 377, 158, 140-A1 (1991)

First Results from the Goddard High-Resolution Spectrograph: High-Resolution Observations of the 1942 Å Resonance Line of Hg II in the Chemically Peculiar B Star,  $\chi$  Lupi. *David S. Leckrone, Glenn M. Wahlgren, & Sveneric G. Johansson.* 377, L37, 143-E1 (1991)

Forbidden Lines of  $np^n$  Ions. II. Line Intensities. *John P. Lynch & Menas Kafatos.* 76, 1169, 41-F7 (1991)

Dielectronic Recombination Rate Coefficients for  $S^{q+}$  ( $q = 1-5$ ) Ions. *N. R. Badnell.* 379, 356, 167-D9 (1991)

The  $3s^23p^2-3s3p^2$   $^4P$  Intercombination Lines of Fe XIV in the Sun. *F. P. Keenan, P. L. Dufton, E. S. Conlon, M. B. Boylan, A. E. Kingston, & K. G. Widing.* 379, 406, 168-A11 (1991)

Atomic Data for Resonance Absorption Lines. I. Wavelengths Longward of the Lyman Limit. *Donald C. Morton.* 77, 119, 45-B1 (1991)

On Solar Emission Lines. *G. P. Malik, L. K. Pande, & Vijaya S. Varma.* 379, 788, 174-E1 (1991)

Collisional Rates and Cooling within Atomic Hydrogen Plasmas. *T. T. Scholz & H. R. J. Walters.* 380, 302, 180-A5 (1991)

Radiative Widths and Splitting of Cyclotron Lines in Superstrong Magnetic Fields. *G. G. Pavlov, V. G. Bechastnov, P. Mészáros, & S. G. Alexander.* 380, 541, 185-A1 (1991)

Integral and Differential Cross Sections for Electron Impact Ionization. II. *E. H. Clark, J. Abdallah, Jr., & J. B. Mann.* 381, 597, 198-B9 (1991)

N III Line Emission in Planetary Nebulae: Not Bowen Fluorescence. *S. O. Kasimir & A. K. Bhatia.* 381, L59, 199-D7 (1991)

Improved Line Ratio Calculations Involving  $\Delta n = 1$  (2-3) Transitions in O V and a Reanalysis of *Skylab* Observations of Solar Flares. *F. P. Keenan, P. L. Dufton, L. K. Harra, E. S. Conlon, K. A. Berrington, A. E. Kingston, & K. G. Widing.* 382, 349, 204-E1 (1991)

Regularities of Stark Parameters along the Periodic Table. *J. Puric, M. Čuk, M. S. Dimirijević, & A. Lesage.* 382, 353, 204-E7 (1991)

Effective Collision Strengths among Fine-Structure Levels of Ca XV: Erratum. *K. M. Aggarwal, K. A. Berrington, & F. P. Keenan.* 77, 441, 50-F1 (1991)

The Rosseland Mean Free-Free Gaunt Factor of the Dense High-Temperature Stellar Plasma. *Naoki Itoh, Fumiyoji Kuwashima, Kokil Ichihashi, & Haruhiko Mutoh.* 382, 636, 209-E1 (1991)

New Photoionization Models of Intergalactic Clouds. *Megan Donahue & J. Michael Shull.* 383, 511, 220-F1 (1991)

Collision Strengths and Excitation Rate Coefficients for Transitions in Fe XXI. *Kanti M. Aggarwal.* 77, 677, 54-A1 (1991)

#### BLACK HOLES

"Superlow-State" Hard X-Ray Observation of Cygnus X-1. *P. Ubertini, A. Bazzano, F. Perotti, E. Quadrini, A. Court, A. J. Dean, N. Dipper, R. Lewis, L. Bassani, & J. B. Stephen.* 366, 544, 9-G1 (1991)

Accretion Disk Emission from a BL Lacertae Object. *Amri Wandell & C. Megan Urry.* 367, 78, 13-A5 (1991)

Application of a General Relativistic Accretion Disk Model to LMC X-1, LMC X-3, X1608-522, and X1636-536. *Ken Ebisawa, Kazuhisa Mitsuda, & Tomoyuki Hanawa.* 367, 213, 14-F8 (1991)

Universal Particle Acceleration. *J. I. Katz.* 367, 407, 18-E1 (1991)

Structure of Thermal Pair Clouds around Gamma-Ray-emitting Black Holes. *Edison P. Liang.* 367, 470, 19-C1 (1991)

Dynamical and Luminosity Evolution of Active Galactic Nuclei: Models with a Mass Spectrum. *Brian W. Murphy, Haldan N. Cohn, & Richard H. Durisen.* 370, 60, 47-G1 (1991)

- Two-Temperature Accretion Disks with Winds in a Fluid Approximation. *Masaaki Kusunose*. 370, 505, 54-F1 (1991)
- Radius-Luminosity and Mass-Luminosity Relationships for Active Galactic Nuclei. *Anuradha P. Koratkar & C. Martin Gaskell*. 370, L61, 59-B1 (1991)
- Cosmic Rays from Primordial Black Holes. *Jane H. MacGibbon & B. J. Carr*. 371, 447, 67-B5 (1991)
- The Effect of Anisotropic Emission from Thick Accretion Disks on the Luminosity Functions of Active Galactic Nuclei. *C. M. Urry, P. Marziani, & M. Calvani*. 371, 510, 67-G7 (1991)
- A Recipe for Making Hot Accretion Disks. *Gunnlaugur Björnsson & Roland Svensson*. 371, L69, 73-C10 (1991)
- New Model for the 0957+561 Gravitational Lens System: Bounds on Masses of a Possible Black Hole and Dark Matter and Prospects for Estimation of  $H_0$ . *E. E. Falco, M. V. Gorenstein, & I. I. Shapiro*. 372, 364, 80-D1 (1991)
- Magnetically Dominated Accretion onto Black Holes. *Brian Punshy*. 372, 424, 81-B1 (1991)
- Evolution of the Luminosity Function of Quasar Accretion Disks. *David M. Caditz, Vahé Petrosian, & Amri Wandel*. 372, L63, 85-C1 (1991)
- IUE Observations of NGC 5548, 1978–1988: The Sizes and Kinematics of the Broad-Line Region. *Anuradha P. Koratkar & C. Martin Gaskell*. 375, 85, 112-A13 (1991)
- Arc Hypernovae Detectable? *Seok Jae Park & Ethan T. Vishniac*. 375, 565, 119-F9 (1991)
- Line Profiles from a Disk around a Rotating Black Hole. *Ari Laor*. 376, 90, 126-B1 (1991)
- Luminosity Limit for Alpha-Viscosity Accretion Disks. *Edison P. Liang & Amri Wandel*. 376, 746, 135-E8 (1991)
- Radiative-hydrodynamical Simulations of Accretion Disk Coronae. *Fulvio Melia, Gregory J. Zylstra, & Bruce Fryxell*. 377, L101, 150-E11 (1991)
- Diskoseismology: Probing Accretion Disks. I. Trapped Adiabatic Oscillations. *Michael A. Nowak & Robert V. Wagoner*. 378, 656, 160-E9 (1991)
- Neutron Star and Black Hole Binaries in the Galaxy. *Ramesh Narayan, Tsvi Piran, & Amotz Shemi*. 379, L17, 169-B11 (1991)
- The Rate of Neutron Star Binary Mergers in the Universe: Minimal Predictions for Gravity Wave Detectors. *E. S. Phinney*. 380, L17, 181-C6 (1991)
- Galactic Center Gasdynamics: A One-armed Spiral in a Keplerian Disk. *J. H. Lacy, J. M. Achtermann, & E. Serabyn*. 380, L71, 188-D6 (1991)
- Massive Black Holes in the Nuclei of Spiral Galaxies: M31 and the Problem of the Initial Conditions. *M. Bradley, A. Curir, & F. de Felice*. 381, 72, 189-G11 (1991)
- Compton Backscattered 511 keV Annihilation Line Emission and the 170 keV Line from the Galactic Center Direction. *Richard E. Lingenfelter & Xin-Min Hua*. 381, 426, 196-A10 (1991)
- Pair-Density Transitions in Accretion Disk Coronae. *Masaaki Kusunose & Shin Mineshige*. 381, 490, 196-G1 (1991)
- Three-dimensional Simulations of Black Hole Tori. *John F. Hawley*. 381, 496, 196-G9 (1991)
- Spherical Accretion onto Black Holes: A Complete Analysis of Stationary Solutions. *Luciano Nobili, Roberto Turolla, & Luca Zampieri*. 383, 250, 215-C9 (1991)
- Low-Flux Hard X-Ray Observation of Cygnus X-1. *P. Ubertini, A. Bazzano, C. La Padula, R. K. Manchanda, V. F. Polcaro, R. Stauber, E. Kendziorra, & F. Perotti*. 383, 263, 215-D9 (1991)
- Relativistic Electron-Positron Beam Formation in the Framework of the Two-Flow Model for Active Galactic Nuclei. *Gilles Henri & Guy Pelletier*. 383, L7, 219-B1 (1991)
- SIGMA Discovery of Variable  $e^+e^-$  Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7–2942. *L. Bouchet, P. Mandrou, J. P. Roques, G. Vedrenne, B. Cordier, A. Goldwurm, F. Lebrun, J. Paul, R. Sunyaev, E. Churazov, M. Gilfanov, M. Pavlynsky, S. Grebenev, G. Babalyan, I. Dekhanov, & N. Khavenson*. 383, L45, 226-C1 (1991)
- Three Spectral States of 1E 1740.7–2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature. *R. Sunyaev, E. Churazov, M. Gilfanov, M. Pavlynsky, S. Grebenev, G. Babalyan, I. Dekhanov, N. Khavenson, L. Bouchet*, &
- P. Mandrou, J. P. Roques, G. Vedrenne, B. Cordier, A. Goldwurm, F. Lebrun, & J. Paul*. 383, L49, 226-C6 (1991)
- BL LACERTAE OBJECTS**
- BL Lacertae Objects and Radio-loud Quasars within an Evolutionary Unified Scheme. *F. Vagnetti, E. Giallongo, & A. Cavaliere*. 368, 366, 29-E11 (1991)
- Fanaroff-Riley I Galaxies as the Parent Population of BL Lacertae Objects. II. Optical Constraints. *P. Padovani & C. M. Urry*. 368, 373, 29-F6 (1991)
- The Number Count Distribution for X-Ray-selected BL Lacertae Objects and Constraints on the Luminosity Function. *Anna Wolter, I. M. Gioia, T. Maccacaro, S. L. Morris, & J. T. Stocke*. 369, 314, 41-F5 (1991)
- A Ubiquitous Absorption Feature in the X-Ray Spectra of BL Lacertae Objects. *Greg M. Madejski, Richard F. Mushotzky, Kimberly A. Weaver, Keith A. Arnaud, & C. Megan Urry*. 370, 198, 49-F1 (1991)
- Altered Luminosity Functions for Relativistically Beamed Objects. II. Distribution of Lorentz Factors and Parent Populations with Complex Luminosity Functions. *C. M. Urry & P. Padovani*. 371, 60, 60-G5 (1991)
- Detection of Local Interstellar CO Absorption toward BL Lacertae. *Alan P. Marscher, Thomas M. Bania, & Zhong Wang*. 371, L77, 73-D7 (1991)
- Rapid Ultraviolet Variability in the BL Lacertae Object PKS 2155–304. *R. A. Edelson, J. Saken, G. Pike, C. M. Urry, I. M. George, R. S. Warwick, H. R. Miller, M. T. Carini, & J. R. Webb*. 372, L9, 79-B5 (1991)
- Correlated Radio and Optical Variability in the BL Lacertae Object 0716+714. *A. Quirrenbach, A. Witzel, S. Wagner, F. Sanchez-Pons, T. P. Krichbaum, R. Wegner, K. Anton, U. Erkens, M. Haehnelt, J. A. Zensus, & K. J. Johnston*. 372, L71, 85-C9 (1991)
- Unsaturated Comptonization of Isotropic Photon Spectra by Relativistic Electrons. *Abraham Loeb, Christopher F. McKee, & Ofer Lahav*. 374, 44, 98-E5 (1991)
- Synchrotron Emission from Shocked Relativistic Jets. III. Models for the Centimeter Wave Band Quiescent and Burst Emission from 3C 279 and OT 081. *P. A. Hughes, H. D. Aller, & M. F. Aller*. 374, 57, 98-F5 (1991)
- The Complete Sample of 1 Jansky BL Lacertae Objects. I. Summary Properties. *M. Stickel, P. Padovani, C. M. Urry, J. W. Fried, & H. Kühe*. 374, 431, 104-E1 (1991)
- Optical Polarization of a Complete Sample of Radio Sources. *C. D. Impey, C. R. Lawrence, & S. Tapia*. 375, 46, 111-E10 (1991)
- Scattering-induced Optical Polarization in Thick Accretion Disks. *John F. Kartje & Arieh Königl*. 375, 69, 111-G6 (1991)
- The Einstein Observatory Extended Medium-Sensitivity Survey. II. The Optical Identifications. *John T. Stocke, Simon L. Morris, I. M. Gioia, T. Maccacaro, R. Schild, A. Wolter, Thomas A. Fleming, & J. Patrick Henry*. 76, 813, 36-B1 (1991)
- A Model for the Spectral Variability of BL Lacertae Objects at High Frequencies. *A. Celotti, L. Maraschi, & A. Treves*. 377, 403, 144-G1 (1991)
- The EXOSAT High Galactic Latitude Survey. *P. Giommi, G. Tagliaferri, K. Beuermann, G. Branduardi-Raymont, R. Brissenden, U. Graser, K. O. Mason, J. D. P. Mittaz, P. Murdin, G. Pooley, H.-C. Thomas, & I. Tuohy*. 378, 77, 152-A5 (1991)
- UBVRI Photometry of Stars in the Fields of X-Ray Selected BL Lacertae Objects. *Paul S. Smith, Buell T. Jannuzzi, & Richard Elston*. 77, 67, 44-D1 (1991)
- The Luminosity Function and Cosmological Evolution of X-Ray-selected BL Lacertae Objects. *Simon L. Morris, John T. Stocke, Isabella M. Gioia, Rudy E. Schild, Anna Wolter, Tommaso Maccacaro, & Roberto Della Ceca*. 380, 49, 176-F1 (1991)
- Short-Term X-Ray Variability of the BL Lacertae Object PKS 2155–304: Power Spectrum and Cross-Correlation Analysis. *G. Tagliaferri, L. Stella, L. Maraschi, A. Treves, & A. Celotti*. 380, 78, 177-A5 (1991)
- On the Nebulosity Surrounding the BL Lacertae Object PKS 2155–304. *R. Falomo, E. Giraud, L. Maraschi, J. Melnick, E. G. Tanzi, & A. Treves*. 380, L67, 188-D1 (1991)
- Fanaroff-Riley I Galaxies as the Parent Population of BL Lacertae Objects. III. Radio Constraints. *C. M. Urry, P. Padovani, & M. Stickel*. 382, 501, 207-F13 (1991)

- Multifrequency Observations of BL Lacertae in 1988. *N. Kawai, M. Matsuo, J. N. Bregman, H. D. Aller, M. F. Aller, P. A. Hughes, S. A. Balbus, T. J. Balonek, K. C. Chambers, R. E. S. Clegg, S. D. Clements, R. J. Leacock, A. G. Smith, R. Goodrich, J. S. Miller, M. Hereld, M. G. Hoare, V. A. Hughes, G. K. Miley, G. H. Moriarty-Schieven, K. Matthews, G. Neugebauer, T. Ohashi, P. F. Roche, H. A. Thronson, E. Valtaoja, H. Terasranta, J. R. Webb, B. J. Wills, & D. Wills.* 382, 508, 207-G8 (1991)
- Optical Polarimetry of PKS 2155–304 and Constraints on Accretion Disk Models for BL Lacertae Objects. *Paul S. Smith & Michael L. Sioko.* 383, 580, 221-D9 (1991)
- CA II EMISSION**
- Near-Infrared Time-resolved Spectroscopy of the Cataclysmic Variable YY Draconis. *Mario Mateo, Paula Szkody, & Peter Garnavich.* 370, 370, 51-G8 (1991)
- Ca II H and K Measurements Made at Mount Wilson Observatory, 1966–1983. *Douglas K. Duncan, Arthur H. Vaughan, Olin C. Wilson, George W. Preston, James Frazer, Howard Lanning, Anthony Misch, Jean Mueller, David Soymier, L. Woodard, Sallie L. Baliunas, Robert W. Noyes, Lee W. Hartmann, Alain Portet, Cornelis Zwaan, Frans Middekoop, René G. M. Ruttel, & Dimitri Mihalas.* 76, 383, 29-G9 (1991)
- The Chromospheric Emission–Age Relation for Stars of the Lower Main Sequence and Its Implications for the Star Formation Rate. *David R. Soderblom, Douglas K. Duncan, & Dean R. H. Johnson.* 375, 722, 121-F5 (1991)
- CLUSTERS: ASSOCIATIONS**
- Spectroscopic Binaries in the Orion OB1 Association. *Nidia Morrell & Hugo Levato.* 75, 965, 15-F5 (1991)
- The Detection of X-Ray Emission from the OB Associations of the Large Magellanic Cloud. *Q. Wang & D. J. Helfand.* 373, 497, 94-B7 (1991)
- Rotation Periods for Seven Stars in the Trapezium Cluster. *Gregory N. Mandel & William Herbst.* 383, L75, 226-E11 (1991)
- CLUSTERS: DYNAMICS**
- The Postcollapse Core of M15 Imaged with the *HST* Planetary Camera. *Tod R. Lauer, Jon A. Holtzman, S. M. Faber, William A. Baum, Douglas G. Currie, S. P. Ewald, Edward J. Groth, J. Jeff Hester, T. Kelsall, Robert M. Light, C. Roger Lynds, Earl J. O’Neil, Jr., Donald P. Schneider, Edward J. Shaya, & James A. Westphal.* 369, L45, 45-F1 (1991)
- CLUSTERS: GLOBULAR**
- Application of Oxygen-enhanced Evolutionary Sequences to the Horizontal Branch of M15. *Ben Dorman, Young-Wook Lee, & Don A. VandenBerg.* 366, 115, 2-D11 (1991)
- Multiparameter Models for the Dynamic Evolution of Globular Clusters. *Hyung Mok Lee, Gregory G. Fahlman, & Harvey B. Richer.* 366, 455, 8-E1 (1991)
- Thermal Instabilities in Proto-Globular Clusters Resulting from Time-dependent Potentials. *Stephen D. Murray & Douglas N. C. Lin.* 367, 149, 13-G6 (1991)
- Abundances in the Red Giants of M13 and M22. *M. D. Lehner, R. A. Bell, & J. G. Cohen.* 367, 514, 19-F9 (1991)
- Stellar Evolution and Period Changes in RR Lyrae Stars. *Young-Wook Lee.* 367, 524, 19-G7 (1991)
- Metal Abundances of RR Lyrae Variables in Selected Galactic Star Fields. V. The Lick Astrographic Fields at Intermediate Galactic Latitudes. *Nicholas B. Suntzeff, T. D. Kinman, & Robert P. Kraft.* 367, 528, 19-G13 (1991)
- A Search for Instability in Two Families of Spherical Stellar Models. *Martin D. Weinberg.* 368, 66, 24-A1 (1991)
- Star Clusters in the Clouds of Magellan. *Sidney van den Bergh.* 369, 1, 36-A1 (1991)
- The Postcollapse Core of M15 Imaged with the *HST* Planetary Camera. *Tod R. Lauer, Jon A. Holtzman, S. M. Faber, William A. Baum, Douglas G. Currie, S. P. Ewald, Edward J. Groth, J. Jeff Hester, T. Kelsall, Robert M. Light, C. Roger Lynds, Earl J. O’Neil, Jr., Donald P. Schneider, Edward J. Shaya, & James A. Westphal.* 369, L45, 45-F1 (1991)
- Faint Object Camera Observations of a Globular Cluster Nova Field. *Bruce Margon, Scott F. Anderson, Ronald A. Downes, Ralph C. Bohlin, & Peter Jakobsen.* 369, L71, 46-C1 (1991)
- Extragalactic Globular Clusters. II. The M31 Globular Cluster System. *John P. Huchra, Jean P. Brodie, & Stephen M. Kent.* 370, 495, 54-E5 (1991)
- Fokker-Planck Calculations of Star Clusters with Primordial Binaries. *Bin Gao, Jeremy Goodman, Haldan Cohn, & Brian Murphy.* 370, 567, 55-E1 (1991)
- Spatial Structure of the Interstellar Gas toward the Globular Cluster M22. *B. Bates & M. G. Cathey.* 371, L37, 66-E7 (1991)
- Diffusion and Mixing of Lithium and Helium in Population II Dwarfs. *Charles R. Proffitt & Georges Michaud.* 371, 584, 68-G1 (1991)
- Multicolor CCD Photometry of Globular Clusters in Two Virgo Elliptical Galaxies. *Jean Couture, William E. Harris, & J. W. B. Albright.* 372, 97, 75-C1 (1991)
- Star Cluster Evolution with Primordial Binaries. II. Detailed Analysis. *Steve McMillan, Piet Hut, & Junichiro Makino.* 372, 111, 75-D5 (1991)
- Modification of Stellar Populations in Post-Core-Collapse Globular Clusters. *S. Djorgovski, G. Piotto, E. S. Phinney, & D. F. Chernoff.* 372, L41, 79-E1 (1991)
- Limits on Cluster Binaries. *Roger W. Romani & Martin D. Weinberg.* 372, 487, 81-G5 (1991)
- Single and Binary Star Evolution. *Icko Iben, Jr.* 76, 55, 24-G3 (1991)
- The Luminosity Distribution of Globular Clusters in Three Giant Virgo Ellipticals. *William E. Harris, J. W. B. Albright, Christopher J. Pritchett, & Sidney van den Bergh.* 76, 115, 25-D11 (1991)
- Analysis of C IV Absorption Lines from Clouds at High Redshifts. *Wei Peng & Jon C. Weisheit.* 373, 471, 93-G4 (1991)
- C and N Abundances among 47 Tucanae Main-Sequence Stars. *Michael M. Briley, James E. Hesser, & R. A. Bell.* 373, 482, 94-A1 (1991)
- The Globular Cluster  $\omega$  Centauri: The Origin of the Mysterious Correlation between the RR Lyrae Luminosity and [Fe/H]. *Young-Wook Lee.* 373, L43, 97-B7 (1991)
- Timing Observations of the 8 Hour Binary Pulsar 2127+11C in the Globular Cluster M15. *T. A. Prince, S. B. Anderson, S. R. Kulkarni, & A. Wolszczan.* 374, L41, 110-C1 (1991)
- Observation of Neutral Hydrogen in the Globular Cluster NGC 2808. *D. J. Faulkner, Tania R. Scott, P. R. Wood, & Alan E. Wright.* 374, L45, 110-C6 (1991)
- Isochrones for H-burning Globular Cluster Stars. II. The Metallicity Range  $-2.3 < [\text{Fe}/\text{H}] < -0.5$ . *Oscar Straniero & Alessandro Chieffi.* 76, 525, 32-D1 (1991)
- Diameters of Galactic Globular Clusters. *Sidney van den Bergh, Christopher Morbey, & John Pazder.* 375, 594, 120-B1 (1991)
- The Formation and Detection of Strongly Magnetic White Dwarf Binaries in Globular Clusters. *G. Chanmugam, A. Ray, & K. P. Singh.* 375, 600, 120-B9 (1991)
- On the Formation of Globular Clusters. I. Dynamical Limits on Globular Cluster Metallicities. *J. H. Brown, A. Burkert, & James W. Truran.* 376, 115, 126-D1 (1991)
- The Evolution of He-burning Stars: Horizontal and Asymptotic Branches in Galactic Globulars. *V. Castellani, A. Chieffi, & L. Pulone.* 76, 911, 37-C5 (1991)
- Inhomogeneous Halo Collapse and Early Galactic Chemical Evolution: Globular Cluster Metallicities. *G. Malinie, D. H. Hartmann, & G. J. Mathews.* 376, 520, 132-G9 (1991)
- On Spectra of X-Ray Bursters in the Expansion Phase. I. *I. Lapidus.* 377, L93, 150-E1 (1991)
- The Metallicity of RR Lyrae Stars in Baade’s Window. *Alistair R. Walker & Donald M. Terndrup.* 378, 119, 152-D13 (1991)
- Extragalactic Globular Clusters. III. Metallicity Comparisons and Anomalies. *Jean P. Brodie & John P. Huchra.* 379, 157, 165-A1 (1991)
- A Grain-heated, Dusty Planetary Nebula in M22. *Kazimierz J. Borkowski & J. Patrick Harrington.* 379, 168, 165-B1 (1991)
- Lithium in Halo Stars: Constraining the Effects of Helium Diffusion on Globular Cluster Ages and Cosmology. *Constantine P. Deliyannis & Pierre Demarque.* 379, 216, 165-F7 (1991)
- Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2. *D. Barret, S. Mereghetti, J. P. Roques, P. Mandrou, L. Salotti, F. Lebrun, Ph. Laurent, J. Ballet, E. Churazov, M. Gifanov, R. Sunyaev, N. Khavenson, I. Chuklov, B. Novikov, A. Kuznetsov, & A. Dyachkov.* 379, L21, 169-C1 (1991)

- The Stellar Content and Structure of the Globular Cluster NGC 5053.** *Gregory G. Fahlman, Harvey B. Richer, & James Nemec.* 380, 124, 177-E11 (1991)
- Interaction of Mass Lost in Globular Clusters with the Halo Medium.** *D. J. Faulkner & Graeme H. Smith.* 380, 441, 183-F7 (1991)
- Globular Cluster Mass Functions.** *Harvey B. Richer, Gregory G. Fahlman, Roberto Buonanno, Flavio Fusi Pecci, Leonard Searle, & Ian B. Thompson.* 381, 147, 190-G7 (1991)
- Carbon Isotopic Abundances in Giant Stars in the CN-bimodal Globular Clusters NGC 6752 and M4.** *Nicholas B. Suntzeff & Verne V. Smith.* 381, 160, 191-A8 (1991)
- Stellar Encounters Involving Red Giants in Globular Cluster Cores.** *M. B. Davies, W. Benz, & J. G. Hills.* 381, 449, 196-C7 (1991)
- Detection of the Helium Flash Gap in the Integrated ( $U - B$ ) versus ( $B - V$ ) Diagram for 624 Large Magellanic Cloud Clusters.** *E. Bica, J. J. Clariá, H. Dottori, J. F. C. Santos, Jr., & A. Piatti.* 381, L51, 199-C7 (1991)
- Metal-rich Giant Branches of Bulge Clusters: Application to Color-Magnitude Diagrams of M31 and M32.** *E. Bica, B. Barbuy, & S. Ortolani.* 382, L15, 205-B12 (1991)
- Deep VLA Images of Globular Clusters.** *Helen M. Johnston, Shrinivas R. Kulkarni, & W. M. Goss.* 382, L89, 211-D11 (1991)
- On Core Collapse.** *Junichiro Makino & Piet Hut.* 383, 181, 214-C9 (1991)
- The Formation of Primordial Binaries in Globular Clusters by Star-Disk Interactions.** *Stephen D. Murray, C. J. Clarke, & J. E. Pringle.* 383, 192, 214-D7 (1991)
- Two High-Velocity Stars Shot Out from the Core of the Globular Cluster 47 Tucanae.** *G. Meylan, P. Dubath, & M. Mayor.* 383, 587, 221-E4 (1991)
- Implications of Helium Diffusion for Globular Cluster Isochrones and Luminosity Functions.** *Charles R. Proffitt & Don A. Vandenberg.* 77, 473, 51-C10 (1991)
- CLUSTERS: OPEN**
- Spectroscopic Binaries in the Orion Nebula Cluster.** *Helmut A. Abt, Ruyou Wang, & Octavio Cardona.* 367, 155, 14-A1 (1991)
- A 21 Centimeter Line Survey of a Region around Four Outer Galaxy Open Clusters.** *D. Leisawitz & E. J. de Geus.* 75, 835, 13-A1 (1991)
- Spectroscopic Binaries in the Open Cluster Trumpler 16.** *Hugo Levato, Stella Malaroda, Nidia Morrell, Beatriz García, & Carlos Hernández.* 75, 869, 13-C13 (1991)
- Lithium, Age, and Metallicity in Open Clusters.** *Ann Merchant Boesgaard.* 370, L95, 59-E12 (1991)
- Carbon Isotope Ratios along the Giant Branch of M67.** *Kalpana Krishnaswamy Gilroy & Jeffery A. Brown.* 371, 578, 68-F7 (1991)
- DD 13: A Very Young and Heavily Reddened Early O Star in the Large Magellanic Cloud.** *Peter S. Conti & Edward L. Fitzpatrick.* 373, 100, 87-CS (1991)
- The Lithium Abundance of M67 Blue Stragglers: A Constraint on the Blue Straggler Phenomenon.** *C. J. Pritchett & J. W. Glaspey.* 373, 105, 87-C12 (1991)
- The Structure and Evolution of Rich Star Clusters in the Large Magellanic Cloud.** *Rebecca A. W. Elson.* 76, 185, 26-E9 (1991)
- On the Dispersion in Direction of Interstellar Polarization.** *P. C. Myers & A. A. Goodman.* 373, 509, 94-C9 (1991)
- The Chromospheric Activity of Low-Mass Stars in the Hyades.** *John R. Stauffer, Mark S. Giampapa, William Herbst, James M. Vincent, Lee W. Hartmann, & Robert A. Stern.* 374, 142, 99-G1 (1991)
- Photometric Binary Stars in Praesepe and the Search for Globular Cluster Binaries.** *Michael Bolte.* 376, 514, 132-G1 (1991)
- Radial Velocity Measurements in the Pleiades.** *T. Liu, Kenneth A. Janes, & T. M. Bania.* 377, 141, 139-F7 (1991)
- Topography of the Galactic Disk: Z-Structure and Large-Scale Star Formation.** *Emilio J. Alfaro, Jesús Cabrera-Caño, & Antonio J. Delgado.* 378, 106, 152-C10 (1991)
- Reinvestigation of the Binary Frequency in the Open Cluster IC 4665.** *Nidia Morrell & Helmut A. Abt.* 378, 157, 153-A1 (1991)
- The LkHα 101 Infrared Cluster.** *M. Barsony, J. M. Schombert, & K. Kis-Halas.* 379, 221, 165-G1 (1991)
- IUE Observations of Solar-Type Stars in the Pleiades and the Hyades.** *Jean-Pierre Caillaud, Osmi Vilhu, & Jeffrey L. Linsky.* 383, 594, 221-F1 (1991)
- Rotation Periods for Seven Stars in the Trapezium Cluster.** *Gregory N. Mandel & William Herbst.* 383, L75, 226-E11 (1991)
- A Model for the Infrared Emission from an OB Star Cluster Environment.** *D. Leisawitz.* 77, 451, 51-B1 (1991)
- COMETS**
- The Formation of an Ice Crust below the Dust Mantle of a Cometary Nucleus.** *Dina Prialnik & Yuri Mekler.* 366, 318, 5-A6 (1991)
- Observation of a Rapid Decrease in the Brightness of the Coma of 2060 Chiron in 1990 January.** *Bonnie J. Buratti & R. Scott Dunbar.* 366, L47, 6-F1 (1991)
- Nitrogen Abundance in Comet Halley.** *Susan Wyckoff, Stephen C. Tegler, & Lisa Engel.* 367, 641, 21-C1 (1991)
- Ammonia Abundances in Four Comets.** *Susan Wyckoff, Stephen C. Tegler, & Lisa Engel.* 368, 279, 26-E5 (1991)
- New Ultraviolet Spectroscopic Features Found in Comet Borsoen-Metcalfe (1989e).** *C. R. O'Dell, Christopher O. Miller, Anita L. Cochran, William D. Cochran, Chet B. Opal, & Edwin S. Barker.* 368, 616, 32-G1 (1991)
- Gas and Dust Production by Comet P/Halley (1910 II).** *Ellen S. Howell, Barry L. Lutz, & V. M. Slipher.* 371, 776, 71-B11 (1991)
- Densities and Abundances of Hot Cometary Ions in the Coma of P/Halley.** *M. Neugebauer, R. Goldstein, B. E. Goldstein, S. A. Fuselier, H. Balsiger, & W.-H. Ip.* 372, 291, 77-E6 (1991)
- A Sensitive Upper Limit on the Methane Abundance in Comet Levy (1990c).** *T. Y. Brooke, A. T. Tokunaga, H. A. Weaver, G. Chin, & T. R. Geballe.* 372, L113, 85-G1 (1991)
- Synthetic Profile Analysis of the Observed (0,0) Swan Band of Comet Halley.** *K. S. Krishna Swamy.* 373, 266, 89-C7 (1991)
- Analysis of the Swing Effect and Greenstein Effect in Comet P/Halley.** *Wayne A. Jaworski & Jeremy B. Tatsumi.* 377, 306, 141-F11 (1991)
- Sulfur-bearing Ions in the Ionosphere of Comet Halley.** *M. L. Marconi, D. A. Mendis, D. L. Mitchell, R. P. Lin, A. Korth, & H. Rème.* 378, 756, 161-F7 (1991)
- Observations of Comet Levy (1990c) with the Hopkins Ultraviolet Telescope.** *P. D. Feldman, A. F. Davidsen, W. P. Blair, C. W. Bowers, W. V. Dixon, S. T. Durrance, H. C. Ferguson, R. C. Henry, R. A. Kimble, G. A. Kriss, J. W. Kruk, K. S. Long, H. W. Moos, O. Vancura, & T. R. Gull.* 379, L37, 169-D7 (1991)
- Observations of Solar Wind Ion Charge Exchange in the Comet Halley Coma.** *S. A. Fuselier, E. G. Shelley, B. E. Goldstein, R. Goldstein, M. Neugebauer, W.-H. Ip, H. Balsiger, & H. Rème.* 379, 734, 173-G8 (1991)
- The Formation and Role of Water Dimers in a Cometary Atmosphere, with Application to Comet P/Halley.** *J. F. Crifo & Z. Slanina.* 383, 351, 216-F1 (1991)
- Comet P/Halley: Spatial Distributions and Scale Lengths for  $\text{C}_2$ ,  $\text{CN}$ ,  $\text{NH}_2$ , and  $\text{H}_2\text{O}$ .** *Uwe Fink, Michael R. Combi, & Michael A. DiSanti.* 383, 356, 216-F9 (1991)
- CONVECTION**
- Turbulent Compressible Convection.** *Fausto Cattaneo, Nicholas H. Brummell, Juri Toomre, Andrea Malagoli, & Neal E. Hurlbert.* 370, 282, 50-F10 (1991)
- Stellar Turbulent Convection: A New Model and Applications.** *V. M. Canuto & I. Mazzatorta.* 370, 295, 51-A1 (1991)
- Power Spectra of Solar Convection.** *D.-Y. Chou, B. J. LaBonte, D. C. Braun, & T. L. Duvall, Jr.* 372, 314, 77-G5 (1991)
- The Lithium Abundance of M67 Blue Stragglers: A Constraint on the Blue Straggler Phenomenon.** *C. J. Pritchett & J. W. Glaspey.* 373, 105, 87-C12 (1991)
- The Location of the Source of High-Frequency Solar Acoustic Oscillations.** *Pawan Kumar & Edward Lu.* 375, L35, 117-D12 (1991)
- Modeling Mesogranules and Exploders on the Solar Surface.** *G. W. Simon, A. M. Title, & N. O. Weiss.* 375, 775, 122-C7 (1991)
- Li Depletion in F Stars by Internal Gravity Waves.** *Ramón J. García López & Hendrik C. Spruit.* 377, 268, 141-C7 (1991)
- Numerical Study of Compressible Solar Magnetoconvection with an Open Transitional Boundary.** *H. Hanami & T. Tajima.* 377, 694, 148-C6 (1991)
- Turbulence, Convection, and Stability in Accretion Disks.** *César Meirelles Filho.* 378, 266, 154-C4 (1991)

- Dynamical Buoyancy of Hydrodynamic Eddies. *E. N. Parker*. 380, 251, 179-B5 (1991)
- Three-dimensional Compressible Hydrodynamic Convection in the Sun and Stars. *Murshed Hossain & D. J. Mullan*. 380, 631, 186-A10 (1991)
- Metal Opacities and Convective Core Overshooting in Population I Stars. *Richard B. Stothers & Chao-wen Chin*. 381, L67, 199-E7 (1991)
- Observational Tests of Convective Core Overshooting in Stars of Intermediate to High Mass in the Galaxy. *Richard B. Stothers*. 383, 820, 224-D8 (1991)
- Compressible Magnetic Convection: Formulation and Two-dimensional Models. *Peter A. Fox, Michael L. Theobald, & Sabatino Sofia*. 383, 860, 225-A1 (1991)
- COSMIC BACKGROUND RADIATION**
- Cosmic X-Ray Background from Hot Gas. *R. D. Rogers & G. B. Field*. 366, 22, 1-C13 (1991)
- Bursts of Gamma Rays from Compton Scattering at Cosmological Distances. *Andrzej A. Zdziarski, Roland Svensson, & Bohdan Paczyński*. 366, 343, 7-B3 (1991)
- High-Latitude Galactic Emission and the Search for Anisotropies of the Cosmic Background Radiation. *S. Masi, P. de Bernardis, M. De Peris, M. Epifani, M. Gervasi, & G. Guarini*. 366, L51, 11-B1 (1991)
- Coherent Peculiar Velocities and Periodic Redshifts. *Christopher T. Hill, Paul J. Steinhardt, & Michael S. Turner*. 366, L57, 11-B7 (1991)
- Olbers's Paradox and the Spectral Intensity of the Extragalactic Background Light. *Paul S. Wesson*. 367, 399, 18-D5 (1991)
- Cosmic Backgrounds from Primeval Dust. *J. R. Bond, B. J. Carr, & C. J. Hogan*. 367, 420, 18-F1 (1991)
- Microwave Distortions from Collapsing Domain-Wall Bubbles. *Michael S. Turner, Richard Watkins, & Lawrence M. Widrow*. 367, L43, 22-B1 (1991)
- Self-Organization of Cosmic Radiation Pressure Instability. *Craig J. Hogan*. 369, 300, 41-D8 (1991)
- What COBE Might See: The Far-Infrared Cosmological Background. *C. A. Beichman & G. Helou*. 370, L1, 53-B1 (1991)
- Will COBE Challenge the Inflationary Paradigm? Cosmic Microwave Background Anisotropies versus Large-Scale Streaming Motions Revisited. *Krzysztof M. Górski*. 370, L5, 53-B7 (1991)
- A Medium-Scale Measurement of the Cosmic Microwave Background at 3.3 Millimeters. *Peter Meinhold & Philip Lubin*. 370, L11, 53-C1 (1991)
- Correlation Function of Gravitational Deflection Angles of Light Paths. *Kazuya Watanabe & Kenji Tomita*. 370, 481, 54-D1 (1991)
- Compton Reflection in Active Galactic Nuclei and the Cosmic X-Ray Background. *R. D. Rogers & G. B. Field*. 370, L57, 59-A11 (1991)
- Did the Universe Recombine? *James G. Bartlett & Albert Stebbins*. 371, 8, 60-B9 (1991)
- Spectral Distortions of the Microwave Background Radiation Resulting from the Damping of Pressure Waves. *R. A. Daly*. 371, 14, 60-C3 (1991)
- Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background. *G. F. Smoot, C. L. Bennett, A. Kogut, J. Aymon, C. Backus, G. De Amici, K. Galuk, P. D. Jackson, P. Keegstra, L. Rokke, L. Tenorio, S. Torres, S. Gulkis, M. G. Hauser, M. A. Janssen, J. C. Mather, R. Weiss, D. T. Wilkinson, E. L. Wright, N. W. Boggess, E. S. Cheng, T. Kelsall, P. Lubin, S. Meyer, S. H. Moseley, T. L. Murdoch, R. A. Shafer, & R. F. Silverberg*. 371, L1, 66-A7 (1991)
- A Measurement of the Large-Scale Cosmic Microwave Background Anisotropy at 1.8 Millimeter Wavelength. *Stephan S. Meyer, Edward S. Cheng, & Lyman A. Page*. 371, L7, 66-B3 (1991)
- Peculiar Cluster Velocities from Measurements of the Kinematic Sunyaev-Zeldovich Effect. *Yoel Rephaeli & Ofer Lahav*. 372, 21, 74-C7 (1991)
- Limits on Cold Dark Matter Cosmologies from New Anisotropy Bounds on the Cosmic Microwave Background. *Nicola Vittorio, Peter Meinhold, Pio Francesco Muciaccia, Philip Lubin, & Joseph Silk*. 372, L1, 79-A7 (1991)
- Constraints on Open Universe Models from Quadrupole Anisotropy of the Cosmic Microwave Background. *Naoteru Gouda, Naoshi Sugiyama, & Misao Sasaki*. 372, L49, 85-B1 (1991)
- Anisotropies of the Cosmic Background Radiation by Domain Wall Networks. *Yasusada Nambu, Hideki Ishihara, Naoteru Gouda, & Naoshi Sugiyama*. 373, L35, 97-A11 (1991)
- Unsaturated Comptonization of Isotropic Photon Spectra by Relativistic Electrons. *Abraham Loeb, Christopher F. McKee, & Ofer Lahav*. 374, 44, 98-E5 (1991)
- Integrated Far-Infrared Background from Galaxies. *Boqi Wang*. 374, 465, 104-G12 (1991)
- Cosmic Rays and Cosmological Microwave Background Fluctuations. *A. J. Banday, M. Giler, B. Szabelska, J. Szabelski, & A. W. Wolfendale*. 375, 432, 118-B5 (1991)
- Non-Gaussian Temperature Fluctuations in the Cosmic Microwave Background Sky from a Random Gaussian Density Field. *Roberto Scaramella & Nicola Vittorio*. 375, 439, 118-C1 (1991)
- A New Gravitational Interaction of Cosmological Importance. *David P. Crawford*. 377, 1, 138-B1 (1991)
- Fluctuations of the Microwave Background Radiation on Large and Intermediate Angular Scales. *F. Atrio-Barandela, A. G. Doroshkevich, & A. A. Klypin*. 378, 1, 151-A11 (1991)
- Origin of Cosmic X-Ray Background Radiation. *Nobuo Terasawa*. 378, L11, 157-B8 (1991)
- A Compton Reflection Model for the Cosmic X-Ray and Gamma-Ray Backgrounds. *R. D. Rogers & G. B. Field*. 378, L17, 157-C1 (1991)
- Cosmological Constraints on the Zero-Point Electromagnetic Field. *Paul S. Wesson*. 378, 466, 158-C1 (1991)
- The Brightness Temperature of the South Celestial Pole and the Temperature of the Cosmic Background Radiation Measured at 36.6 and 12 Centimeter Wavelength. *G. Sironi, G. Bonelli, & M. Limon*. 378, 550, 159-C1 (1991)
- Do Clusters of Galaxies Affect the Spectrum of the Microwave Background? *M. Markevitch, G. R. Blumenthal, W. Forman, C. Jones, & R. A. Sunyaev*. 378, L33, 162-D1 (1991)
- Constraints on the Thermal History of the Universe from the Cosmic Microwave Background Spectrum. *C. Burigana, G. De Zotti, & L. Danese*. 379, 1, 163-B1 (1991)
- Search for Starbursts among X-Ray-selected Galaxies: Optical Spectroscopy. *Antonella Fruscione & Richard E. Griffiths*. 380, L13, 181-C1 (1991)
- The Temperature of the Cosmic Microwave Background Radiation at 3.8 GHz: Results of a Measurement from the South Pole Site. *Giovanni De Amici, Marco Bersanelli, Al Kogut, Steve Levin, Michele Limon, & George F. Smoot*. 381, 341, 193-C1 (1991)
- Anisotropies of the Cosmic Background Radiation in a "Hot" Dark Matter Universe. *Peter Anninos, Richard A. Matzner, Robin Tuluie, & Joan Centrella*. 382, 71, 201-A1 (1991)
- Cosmic Microwave Background and Galactic Quadrupoles in the Millimeter Region. *Paolo de Bernardis, Silvia Masi, & Nicola Vittorio*. 382, 515, 208-A1 (1991)
- Microwave Background Anisotropies Implied by Large-Scale Galaxy Correlations: The Minimum of  $C(0)$  and Cosmological Parameters. *A. Kashlinsky*. 383, L1, 219-A7 (1991)
- Relativistic Enhancement of the Compton-reflected Component in Active Galactic Nuclei. *R. D. Rogers*. 383, 550, 221-B4 (1991)
- COSMIC RAYS: ABUNDANCES**
- Energy Spectra and Composition of Primary Cosmic Rays. *Dietrich Müller, Simon P. Swordy, Peter Meyer, Jacques L'Heureux, & John M. Grunsfeld*. 374, 356, 102-E1 (1991)
- Ionization States of the Anomalous Cosmic Rays. *R. K. Singh, Banashree Mitra, N. Durgaprasad, S. Biswas, M. N. Vahia, J. S. Yadav, A. Dutta, & J. N. Goswami*. 374, 753, 108-D7 (1991)
- The Charge State of the Anomalous Component of Cosmic Rays. *J. H. Adams, Jr., M. García-Munoz, N. L. Grigorov, B. Klecker, M. A. Kondratyeva, G. M. Mason, R. E. McGuire, R. A. Mewaldt, M. I. Panasyuk, Ch. A. Tretyakova, A. J. Tylka, & D. A. Zhuravlev*. 375, L45, 124-B6 (1991)
- The Charge State of the Anomalous Component: Results from the Trapped Ions in Space Experiment. *James H. Adams, Jr., Lorraine P. Beahm, & Allan J. Tylka*. 377, 292, 141-E9 (1991)

- The  $^{54}\text{Mn}$  Clock and Its Implications for Cosmic-Ray Propagation and Fe Isotope Studies. *J. E. Grove, B. T. Hayes, R. A. Mewaldt, & W. R. Webber.* 377, 680, 148-B3 (1991)
- A Measurement of the Cosmic-Ray  $^2\text{H}$  and  $^3\text{He}$  Spectra and  $^2\text{H}/^4\text{He}$  and  $^3\text{He}/^4\text{He}$  Ratios in 1989. *W. R. Webber, R. L. Golden, S. J. Stochaj, J. F. Ormes, & R. E. Streitmatter.* 380, 230, 178-G9 (1991)
- On the Differences in Element Abundances of Energetic Ions from Corotating Events and from Large Solar Events. *D. V. Reames, I. G. Richardson, & L. M. Barbier.* 382, L43, 205-E7 (1991)
- COSMIC RAYS: GENERAL**
- Heliospheric Effects on Cosmic-Ray Electrons. *H. Moraal, J. R. Jokipii, & R. A. Mewaldt.* 367, 191, 14-D8 (1991)
- Cosmic Rays from Primordial Black Holes. *Jane H. MacGibbon & B. J. Carr.* 371, 447, 67-B5 (1991)
- Viscosity and Inertia in Cosmic-Ray Transport: Effects of an Average Magnetic Field. *L. L. Williams & J. R. Jokipii.* 371, 639, 69-E3 (1991)
- Cosmic-Ray Diurnal Anisotropy, 1936–1988: Implications for Drift and Modulation Theories. *John W. Bieber & Jiasheng Chen.* 372, 301, 77-F4 (1991)
- Solar Modulation of Cosmic Electrons: Evidence for Dynamic Regulation. *Evelyn Tuska, Paul Evenson, & Peter Meyer.* 373, L27, 91-D1 (1991)
- Observations of Ultra-High-Energy Photons from Cygnus X-3. *Y. Muraki, S. Shibata, T. Aoki, K. Mitsui, A. Okada, Y. Ohashi, K. Kobayakawa, H. Kojima, T. Kitamura, Y. Kato, T. Takahashi, & I. Nakanura.* 373, 657, 96-B4 (1991)
- Cosmic-Ray Distribution and the Dynamic Balance in the Large Magellanic Cloud. *Carl E. Fichtel, Mehmet E. Özel, Robert G. Stone, & P. Sreekumar.* 374, 134, 99-F7 (1991)
- Energy Spectra and Composition of Primary Cosmic Rays. *Dietrich Müller, Simon P. Swordy, Peter Meyer, Jacques L'Heureux, & John M. Grunsfeld.* 374, 356, 102-E1 (1991)
- Ionization States of the Anomalous Cosmic Rays. *R. K. Singh, Banashree Mitra, N. Durgaprasad, S. Biswas, M. N. Vahia, J. S. Yadav, A. Dutta, & J. N. Goswami.* 374, 753, 108-D7 (1991)
- Energy Degradation of Fast Electrons in Hydrogen Gas. *Yueming Xu & Richard McCray.* 375, 190, 113-D1 (1991)
- Search for Diffuse Cosmic Gamma Rays above 200 TeV. *J. Matthews, D. Ciampa, K. D. Green, J. Kolodziejczak, D. Nitz, D. Sinclair, G. Thornton, J. C. van der Velde, G. L. Cassiday, R. Cooper, S. C. Corbato, B. R. Dawson, J. W. Elbert, B. E. Fick, D. B. Kieda, S. Ko, D. F. Liebing, E. C. Loh, M. H. Salamon, J. D. Smith, P. Sokolsky, S. B. Thomas, & B. Wheeler.* 375, 202, 113-E1 (1991)
- Cosmic Rays and Cosmological Microwave Background Fluctuations. *A. J. Banday, M. Giler, B. Szabelska, J. Szabelski, & A. W. Wolfendale.* 375, 432, 118-B5 (1991)
- The Charge State of the Anomalous Component of Cosmic Rays. *J. H. Adams, Jr., M. Garcia-Munoz, N. L. Grigorov, B. Klecker, M. A. Kondratenko, G. M. Mason, R. E. McGuire, R. A. Mewaldt, M. I. Panasyuk, Ch. A. Treyakova, A. J. Tyka, & D. A. Zhuravlev.* 375, L45, 124-B6 (1991)
- Mayflower Mine 1500 GV Detector: Cosmic-Ray Anisotropy and Search for Cygnus X-3. *D. J. Cutler & D. E. Groom.* 376, 322, 128-G12 (1991)
- The Charge State of the Anomalous Component: Results from the Trapped Ions in Space Experiment. *James H. Adams, Jr., Loraine P. Beahm, & Allan J. Tyka.* 377, 292, 141-E9 (1991)
- Cosmic-Ray Heating of Cooling Flows: A Critical Analysis. *Michael Loewenstein, Ellen G. Zweibel, & Mitchell C. Begelman.* 377, 392, 144-F4 (1991)
- Cosmic-Ray Transport and Gamma-Ray Emission in Supernova Shells. *A. K. Harding, A. Mastichiadis, R. J. Protheroe, & A. P. Szabo.* 378, 163, 153-A9 (1991)
- Measurement of Cosmic-Ray Proton and Helium Spectra during the 1987 Solar Minimum. *E. S. Seo, J. F. Ormes, R. E. Streitmatter, S. J. Stochaj, W. V. Jones, S. A. Stephens, & T. Bowen.* 378, 763, 161-G1 (1991)
- Desorption of Large Molecules from Grains in Dense Interstellar Clouds. *R. E. Johnson, V. Pirronello, B. Sundqvist, & B. Donn.* 379, L75, 175-D12 (1991)
- Statistical Properties of Shock-accelerated Ions in the Outer Heliosphere. *L. J. Lanzerotti, R. E. Gold, D. J. Thomson, R. E. Decker, C. G. Maclennan, & S. M. Krimigis.* 380, L93, 188-F10 (1991)
- Outflows Driven by Cosmic-Ray Pressure in Broad Absorption Line QSOs. *Mitchell C. Begelman, Martijn de Kool, & Marek Sikora.* 382, 416, 206-F9 (1991)
- Signatures of Cosmic-Ray Interactions on the Solar Surface. *D. Seckel, Todor Stanev, & T. K. Gaisser.* 382, 652, 209-F8 (1991)
- Magnetized Supernova Remnants with Cosmic Rays. *Katia M. Ferrière & Ellen G. Zweibel.* 383, 602, 221-F11 (1991)
- COSMOLOGY**
- Bursts of Gamma Rays from Compton Scattering at Cosmological Distances. *Andrzej A. Zdziarski, Roland Svensson, & Bohdan Paczyński.* 366, 343, 7-B3 (1991)
- N-Body Simulation of Large-Scale Structures in  $\Lambda \neq 0$  Friedmann Models. *Hugo Martel.* 366, 353, 7-C1 (1991)
- On the "Mixing" of Self-gravitating Systems in a Cosmological Context. *Henry E. Kandrup.* 366, 384, 7-E7 (1991)
- X-Ray Luminosity Functions of Clusters of Galaxies. *A. Cavaliere, R. Burg, & R. Giacconi.* 366, L61, 11-B11 (1991)
- A Change in the Cluster Environments of Radio Galaxies with Cosmic Epoch. *G. J. Hill & S. J. Lilly.* 367, 1, 12-A13 (1991)
- The Redshift Distribution of Ly $\alpha$  Clouds and the Proximity Effect. *Limin Lu, Arthur M. Wolfe, & David A. Turnshek.* 367, 19, 12-C5 (1991)
- Seeded Hot Dark Matter Models for Large-Scale Structure. *Jens V. Villumsen, Robert J. Scherrer, & Edmund Bertschinger.* 367, 37, 12-D11 (1991)
- Dynamical Biases in Gravitational Clustering. *R. G. Carlberg.* 367, 385, 18-C1 (1991)
- Comparison of Likely Candidate Models for Abell Cluster Structures against the Observed Distribution. *David J. Batuski, Adrian L. Melott, Robert J. Scherrer, & Edmund Bertschinger.* 367, 393, 18-C11 (1991)
- Olbers's Paradox and the Spectral Intensity of the Extragalactic Background Light. *Paul S. Wesson.* 367, 399, 18-D5 (1991)
- Dark Matter Decay and the Temperature of Lyman-Alpha Clouds. *D. W. Scrima.* 367, L39, 22-A11 (1991)
- Microwave Distortions from Collapsing Domain-Wall Bubbles. *Michael S. Turner, Richard Watkins, & Lawrence M. Widrow.* 367, L43, 22-B1 (1991)
- The Number Counts and Infrared Backgrounds from Infrared-bright Galaxies. *P. B. Hacking & B. T. Soifer.* 367, L49, 22-B7 (1991)
- Neutrino Oscillations and the Leptonic Charge of the Universe. *Martin J. Savage, Robert A. Malaney, & George M. Fuller.* 368, 1, 23-B1 (1991)
- Simulated Optical Images of Galaxies at  $z \sim 1$  Using Ultraviolet Images of Nearby Galaxies. *Ralph C. Bohlin, Robert H. Cornett, Jesse K. Hill, Robert S. Hill, Wayne B. Landsman, Robert W. O'Connell, Susan G. Neff, Andrew M. Smith, & Theodore P. Stecher.* 368, 12, 23-C1 (1991)
- Lyman- $\alpha$  Companions to High- $z$  Quasars. *Esther M. Hu, Antoinette Songaila, Lennox L. Cowie, & Alan Stockton.* 368, 28, 23-D9 (1991)
- Expansion-cooled Lyman-Alpha Clouds. *Robert C. Duncan, Ethan T. Vishniac, & Jeremiah P. Ostriker.* 368, L1, 28-B1 (1991)
- The Angular Correlation Function of Galaxies from POSS-II. *Alain Picard.* 368, L7, 28-B7 (1991)
- Zero Point of the Supernova Hubble Diagram. *M. Fukugita & C. J. Hogan.* 368, L11, 28-C1 (1991)
- Dissipationless Collapse in an Expanding Universe. *Neal Katz.* 368, 325, 29-B4 (1991)
- Numerical Study of a Perturbed Einstein-de Sitter Cosmological Model. *H. V. Fagundes & S. F. Kwok.* 368, 337, 29-C4 (1991)
- Mesh-refined P $^3$ M: A Fast Adaptive N-Body Algorithm. *H. M. P. Couchman.* 368, L23, 35-A11 (1991)

- Application of the Ewald Method to Cosmological *N*-Body Simulations. *Lars Hernquist, François R. Bouchet, & Yasushi Suto.* 75, 231, 4-B1 (1991)
- Cluster Infall with Friction. *R. G. Carlberg & John Dubinski.* 369, 13, 36-B11 (1991)
- Universe with Oscillating Expansion Rate. *Masahiro Morikawa.* 369, 20, 36-C5 (1991)
- Scaling Invariance in the Galaxy Distribution. II. Spatial and Luminosity Effects. *Sophie Maurogordato & Marc Lachièze-Rey.* 369, 30, 36-D1 (1991)
- Large-Aperture *BVRJK* Photometry of Rich Abell Clusters: Constraints on Dark Matter. *Juan M. Uson & Stephen P. Boughn.* 369, 38, 36-D11 (1991)
- Diffuse Light in Dense Clusters of Galaxies. I. *R*-Band Observations of Abell 2029. *Juan M. Uson, Stephen P. Boughn, & Jeffrey R. Kuhn.* 369, 46, 36-E7 (1991)
- Measures of Large-Scale Structure in the CfA Redshift Survey Slices. *Valérie de Lapparent, Margaret J. Geller, & John P. Huchra.* 369, 273, 41-B5 (1991)
- Filamentary Superclustering in a Universe Dominated by Cold Dark Matter. *Michael J. West, Jens V. Villumsen, & Avishai Dekel.* 369, 287, 41-C7 (1991)
- Self-Organization of Cosmic Radiation Pressure Instability. *Craig J. Hogan.* 369, 300, 41-D8 (1991)
- Gravitational Lensing by Clusters of Galaxies: Constraining the Mass Distribution. *Jordi Miralda-Escudé.* 370, 1, 47-B1 (1991)
- What COBE Might See: The Far-Infrared Cosmological Background. *C. A. Beichman & G. Helou.* 370, L1, 53-B1 (1991)
- Will COBE Challenge the Inflationary Paradigm? Cosmic Microwave Background Anisotropies versus Large-Scale Streaming Motions Revisited. *Krzysztof M. Górski.* 370, L5, 53-B7 (1991)
- A Medium-Scale Measurement of the Cosmic Microwave Background at 3.3 Millimeters. *Peter Meinhold & Philip Lubin.* 370, L11, 53-C1 (1991)
- Redshift-Space Correlation Functions in the Cold Dark Matter Scenario. *Yasushi Suto & Tatsushi Sugihara.* 370, L15, 53-C7 (1991)
- Cosmological *N*-Body Simulations with a Tree Code: Fluctuations in the Linear and Nonlinear Regimes. *Tatsushi Sugihara, Yasushi Suto, François R. Bouchet, & Lars Hernquist.* 75, 631, 10-B1 (1991)
- The Surface Brightness Test for the Expansion of the Universe. III. Reduction of Data for the Several Brightest Galaxies in Clusters to Standard Conditions and a First Indication That the Expansion Is Real. *Allan Sandage & Jean-Marc Perelmutter.* 370, 455, 54-B1 (1991)
- Radiation-induced Reversal of Baryonic Perturbations. *W. H. Zurek.* 370, 474, 54-C8 (1991)
- Correlation Function of Gravitational Deflection Angles of Light Paths. *Kazuya Watanabe & Kenji Tomita.* 370, 481, 54-D1 (1991)
- Second-Order Perturbation Theory in  $\Omega \neq 1$  Friedmann Models. *Hugo Martel & Wolfram Freudling.* 371, 1, 60-B1 (1991)
- Did the Universe Recombine? *James G. Bartlett & Albert Stebbins.* 371, 8, 60-B9 (1991)
- Spectral Distortions of the Microwave Background Radiation Resulting from the Damping of Pressure Waves. *R. A. Daly.* 371, 14, 60-C3 (1991)
- High-Resolution Spectroscopy of Q1100–264 Again. *R. F. Carswell, K. M. Lanzetta, H. C. Parnell, & J. K. Webb.* 371, 36, 60-E1 (1991)
- Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background. *G. F. Smoot, C. L. Bennett, A. Kogut, J. Aymon, C. Backus, G. De Amici, K. Galuk, P. D. Jackson, P. Keegstra, L. Rokke, L. Tenorio, S. Torres, S. Gulkis, M. G. Hauser, M. A. Janssen, J. C. Mather, R. Weiss, D. T. Wilkinson, E. L. Wright, N. W. Boggess, E. S. Cheng, T. Kelsall, P. Lubin, S. Meyer, S. H. Moseley, T. L. Murdoch, R. A. Shafer, & R. F. Silverberg.* 371, L1, 66-A7 (1991)
- A Measurement of the Large-Scale Cosmic Microwave Background Anisotropy at 1.8 Millimeter Wavelength. *Stephan S. Meyer, Edward S. Cheng, & Lyman A. Page.* 371, L7, 66-B3 (1991)
- Primordial  ${}^4\text{He}$  as a Test of Big Bang Nucleosynthesis. *G. M. Fuller, R. N. Boyd, & J. D. Kalen.* 371, L11, 66-B7 (1991)
- Statistics of Peaks in Cosmological Nonlinear Density Fields. *Tatsushi Sugihara & Yasushi Suto.* 371, 470, 67-D1 (1991)
- Bosons: Hot Dark Matter with Small-Scale Power. *Jes Madsen.* 371, L47, 73-A11 (1991)
- Discovery of a Normal Galaxy at  $z = 1.018$ . *D. J. Thompson & S. Djorgovski.* 371, L55, 73-B6 (1991)
- Faint Galaxies: Bounds on the Epoch of Galaxy Formation and the Cosmological Deceleration Parameter. *Yuzuru Yoshii & Bruce A. Peterson.* 372, 8, 74-B6 (1991)
- Limits on Cold Dark Matter Cosmologies from New Anisotropy Bounds on the Cosmic Microwave Background. *Nicola Vittorio, Peter Meinhold, Pio Francesco Muciaccia, Philip Lubin, & Joseph Silk.* 372, L1, 79-A7 (1991)
- The Formation of Galaxies and Quasars in a Texture-seeded Cold Dark Matter Cosmogony. *Andrew K. Gooding, David N. Spergel, & Neil Turok.* 372, L5, 79-A13 (1991)
- Gravitational Clustering in the Expanding Universe: Controlled High-Resolution Studies in Two Dimensions. *John Francis Beacom, Kurt G. Dominik, Adrian L. Melott, Sam P. Perkins, & Sergei F. Shandarin.* 372, 351, 80-B7 (1991)
- New Model for the 0957+561 Gravitational Lens System: Bounds on Masses of a Possible Black Hole and Dark Matter and Prospects for Estimation of  $H_0$ . *E. E. Falco, M. V. Gorenstein, & I. I. Shapiro.* 372, 364, 80-D1 (1991)
- Constraints on Open Universe Models from Quadrupole Anisotropy of the Cosmic Microwave Background. *Naoteru Gouda, Naoshi Sugiyama, & Misao Sasaki.* 372, L49, 85-B1 (1991)
- Large-Scale Structure in a Texture-seeded Cold Dark Matter Cosmogony. *Changbom Park, David N. Spergel, & Neil Turok.* 372, L53, 85-B5 (1991)
- The Correlation Function of cD Clusters. *Michael J. West & Sidney van den Bergh.* 373, 1, 86-B1 (1991)
- Gaseous Halos of Elliptical Galaxies, the Cosmic Evolution of Their Radio Sizes, and the Phenomenon of Compact Steep-Spectrum Sources. *Gopal-Krishna & Paul J. Wiita.* 373, 325, 92-B1 (1991)
- Anisotropies of the Cosmic Background Radiation by Domain Wall Networks. *Yasusada Nambu, Hideki Ishihara, Naoteru Gouda, & Naoshi Sugiyama.* 373, L35, 97-A11 (1991)
- Voids in a Neutrino-dominated Universe. *Ning Zeng & Simon D. M. White.* 374, 1, 98-B1 (1991)
- The Hydrodynamics of Relict Cosmological H II Regions and the Formation of Objects at High Redshift. *Piero Madau & Avery Meiksin.* 374, 6, 98-B7 (1991)
- Reconstructing the Primordial Spectrum of Fluctuations of the Universe from the Observed Nonlinear Clustering of Galaxies. *A. J. S. Hamilton, P. Kumar, Edward Lu, & Alex Matthews.* 374, L1, 103-B7 (1991)
- Gravitational Lens Interference. *J. B. Peterson & Toby Falk.* 374, L5, 103-C1 (1991)
- Integrated Far-Infrared Background from Galaxies. *Boqi Wang.* 374, 465, 104-G12 (1991)
- General Structure of the Gravitational Equations of Motion in Conformal Weyl Gravity. *Demosthenes Kazanas & Philip D. Mannheim.* 76, 431, 31-B1 (1991)
- Evolution of High-Redshift Lyman-Limit Absorption Systems. *Kenneth M. Lanzetta.* 375, 1, 111-A11 (1991)
- A Limit on the Cosmological Constant. *R. G. Carlberg.* 375, 429, 118-B1 (1991)
- Perturbations of the Robertson-Walker Space: Multicomponent Sources and Generalized Gravity. *Jai-chan Hwang.* 375, 443, 118-C7 (1991)
- Perturbations in a Singularity-free Cosmological Model. *Mark Israelit & Nathan Rosen.* 375, 463, 118-E1 (1991)
- Perturbations in a Singularity-free Cosmological Model. II. The Synchronous Gauge. *Mark Israelit.* 375, 473, 118-F1 (1991)
- The Accuracy of Galaxy Masses from the Timing Argument. *T. L. Kroeker & R. G. Carlberg.* 376, 1, 125-B1 (1991)
- The Distance to the Coma Cluster Using the *B*-Band Tully-Fisher Relation. *M. Fukugita, S. Okamura, K. Tarusawa, H. J. Rood, & B. A. Williams.* 376, 8, 125-B9 (1991)
- The Distribution of Clusters of Galaxies within 300  $\text{Mpc h}^{-1}$  and the Crossover to an Isotropic and Homogeneous Universe. *Roberto*

- Scaramella, Giampaolo Vettolani, & Giovanni Zamorani.** 376, L1, 130-A7 (1991)
- Gravitational Clustering of Gaussian Density Fluctuations and the Origin of Hierarchy Correlations.** *A. Kashlinsky.* 376, L5, 130-B1 (1991)
- Formation of Galactic Halos from Seeded Hot Dark Matter.** *Anthony van Dalen & Jens Verner Villumsen.* 376, 371, 131-B1 (1991)
- The Fragmentation of "Pancakes" in a Dark Matter-dominated Universe.** *Wenbo Yuan, Joan M. Centrella, & Michael L. Norman.* 376, L29, 137-A11 (1991)
- QSO Absorption Systems and the Origin of the Ionizing Background at High Redshift.** *Piero Madau.* 376, L33, 137-B4 (1991)
- The Merging Runaway.** *A. Cavaliere, S. Colafrancesco, & N. Menci.* 376, L37, 137-B10 (1991)
- A New Gravitational Interaction of Cosmological Importance.** *David F. Crawford.* 377, 1, 138-B1 (1991)
- Linear Perturbation Theory and Spherical Overdensities in  $\Lambda \neq 0$  Friedmann Models.** *Hugo Martel.* 377, 7, 138-B7 (1991)
- The Evolution of Void-filled Cosmological Structures.** *Enikő Regős & Margaret J. Geller.* 377, 14, 138-C1 (1991)
- The Ultraviolet Absorption Spectrum of 3C 273.** *J. N. Bahcall, B. T. Jannuzi, D. P. Schneider, G. F. Hartig, R. Bohlin, & V. Junkkarinen.* 377, L5, 143-B6 (1991)
- First Results from the Goddard High-Resolution Spectrograph: The Galactic Halo and the Ly $\alpha$  Forest at Low Redshift in 3C 273.** *Simon L. Morris, Ray J. Weymann, Blair D. Savage, & Ronald L. Gilliland.* 377, L21, 143-C11 (1991)
- Optical Variability of Quasars: Statistics and Cosmological Properties.** *E. Gallioglio, D. Trevese, & F. Vagnetti.* 377, 345, 144-B6 (1991)
- The Peculiar Velocity Field in the Hercules Region.** *Wolfram Freudling, Hugo Martel, & Martha P. Haynes.* 377, 349, 144-B12 (1991)
- A Search for Redshifted Neutral Hydrogen from Protoclusters of Galaxies.** *Juan M. Uson, Durgadas S. Bagri, & Timothy J. Cornwell.* 377, L65, 150-B1 (1991)
- A  $\sim 10$  Mpc Void in the Ly Forest at  $z = 3.17$ .** *Adam Dobrzański & Jill Bechtold.* 377, L69, 150-B10 (1991)
- Discovery of a Ly $\alpha$  Galaxy near a Damped Ly $\alpha$  Absorber at  $z = 2.3$ .** *James D. Lowenthal, Craig J. Hogan, Richard F. Green, Adeline Caulet, Bruce E. Woodgate, Larry Brown, & Craig B. Foltz.* 377, L73, 150-C1 (1991)
- Fluctuations of the Microwave Background Radiation on Large and Intermediate Angular Scales.** *F. Atrio-Barandela, A. G. Doroshkevich, & A. A. Klypin.* 378, 1, 151-A11 (1991)
- Confirmation of Dust in Damped Lyman-Alpha Systems.** *Yichuan C. Pei, S. Michael Fall, & Jill Bechtold.* 378, 6, 151-B4 (1991)
- Scales of Structures and Homogeneity in the Universe.** *Peter Schuecker & Heinz-Albert Ott.* 378, L1, 157-A7 (1991)
- Gravitational Lensing, Time Delay, and Angular Diameter Distance.** *Ramesh Narayan.* 378, L5, 157-B1 (1991)
- Origin of Cosmic X-Ray Background Radiation.** *Nobuo Terasawa.* 378, L11, 157-B8 (1991)
- Dynamical Evolution of Topology of Large-Scale Structure.** *Changbom Park & J. Richard Gott III.* 378, 457, 158-B1 (1991)
- Models of Voids in the Expanding Universe. II.** *W. B. Bonnor & A. Chamorro.* 378, 461, 158-B7 (1991)
- Cosmological Constraints on the Zero-Point Electromagnetic Field.** *Paul S. Wesson.* 378, 466, 158-C1 (1991)
- Attenuation of Lyman-Alpha Emission by Dust in Damped Lyman-Alpha Systems.** *Stéphane Charlot & S. Michael Fall.* 378, 471, 158-C7 (1991)
- Do Clusters of Galaxies Affect the Spectrum of the Microwave Background?** *M. Markevitch, G. R. Blumenthal, W. Forman, C. Jones, & R. A. Sunyaev.* 378, L33, 162-D1 (1991)
- Cross-Correlation of the X-Ray Background with Nearby Galaxies.** *Keith Jahoda, Ofer Lahav, Richard F. Mushotzky, & Elihu Boldt.* 378, L37, 162-D7 (1991)
- Constraints on the Thermal History of the Universe from the Cosmic Microwave Background Spectrum.** *C. Burigana, G. De Zotti, & L. Danese.* 379, 1, 163-B1 (1991)
- Cosmological Velocity-Density Relation in the Quasi-linear Regime.** *Adi Nusser, Avishai Dekel, Edmund Bertschinger, & George R. Blumenthal.* 379, 6, 163-B7 (1991)
- Superclustering at High Redshifts.** *Michael J. West.* 379, 19, 163-C7 (1991)
- Constraints on Models for the High- and Low-Energy X-Ray Backgrounds.** *R. A. Daly.* 379, 37, 163-E1 (1991)
- A New Spectroscopic Survey for Damped Ly $\alpha$  Absorption Lines from High-Redshift Galaxies.** *Kenneth M. Lanzetta, Arthur M. Wolfe, David A. Turnshek, Limin Lu, Richard G. McMahon, & Cyril Hazard.* 379, 71, 163-E1 (1991)
- Baryon Isocurvature Scenario in Inflationary Cosmology: A Particle Physics Model and Its Astrophysical Implications.** *Jun'ichi Yokoyama & Yasushi Suto.* 379, 427, 170-B1 (1991)
- Excursion Set Mass Functions for Hierarchical Gaussian Fluctuations.** *J. R. Bond, S. Cole, G. Efstathiou, & N. Kaiser.* 379, 440, 170-C1 (1991)
- A Measurement of the Value of the Hubble Constant from the X-Ray Properties and the Sunyaev-Zel'dovich Effect of Abell 665.** *M. Birkinshaw, J. P. Hughes, & K. A. Arnaud.* 379, 466, 170-E1 (1991)
- Power-Spectrum Analysis of One-dimensional Redshift Surveys.** *N. Kaiser & J. A. Peacock.* 379, 482, 170-F5 (1991)
- Small-Scale Fluctuations and Angular Correlations of the X-Ray Background in the HEAO 1 A-2 Energy Band: Constraints on Clustering of X-Ray Sources.** *J. M. Martin-Morales, G. De Zotti, E. A. Boldt, F. E. Marshall, L. Danese, A. Franceschini, & M. Persic.* 379, 507, 171-A4 (1991)
- The Correlation Function of Galaxy Ellipticities Produced by Gravitational Lensing.** *Jordi Miralda-Escudé.* 380, 1, 176-B1 (1991)
- The Mass Distribution of Groups and Clusters of Galaxies.** *A. Cavaliere, S. Colafrancesco, & R. Scaramella.* 380, 15, 176-C1 (1991)
- The Upper Bound to the Primordial Abundance of Helium and the Consistency of the Hot Big Bang Model.** *Keith A. Olive, Gary Steigman, & Terry P. Walker.* 380, L1, 181-B1 (1991)
- Constrained Realizations of Gaussian Fields: A Simple Algorithm.** *Yehuda Hoffman & Erez Ribak.* 380, L5, 181-B6 (1991)
- Large-Scale Evolution of a Perturbed Universe.** *Jai-chan Hwang.* 380, 307, 182-B6 (1991)
- The Scale Dependence of Galaxy Distribution Functions.** *William C. Saslaw & Philippe Crane.* 380, 315, 182-C1 (1991)
- Dynamics of Cooling Gas in Galactic Dark Halos.** *Julio F. Navarro & Willy Benz.* 380, 320, 182-C7 (1991)
- Magnetohydrodynamic Cosmologies.** *R. Portugal & I. Damão Soares.* 380, 330, 182-D5 (1991)
- The Clustering of Faint Galaxies.** *G. Efstathiou, G. Bernstein, N. Katz, J. A. Tyson, & P. Guhathakurta.* 380, L47, 188-B1 (1991)
- On the Cosmological Significance of the Apparent Deficit of Small Interplanetary Scintillation Sources.** *Chris A. Hajivassiliou.* 381, 3, 189-A13 (1991)
- Bounds on Intergalactic Compact Objects from Observations of Compact Radio Sources.** *Aggeliki Kassiola, Israel Kovner, & Roger D. Blandford.* 381, 6, 189-B4 (1991)
- The Evolution of the Diffuse Cosmic Ultraviolet Background Constrained by Hubble Space Telescope Observations of 3C 273.** *Satoru Ikeuchi & Edwin L. Turner.* 381, L1, 194-A9 (1991)
- Statistics of Primordial Density Perturbations from Discrete Seed Masses.** *Robert J. Scherrer & Edmund Bertschinger.* 381, 349, 195-B1 (1991)
- Systematic Bias in Cluster Galaxy Data, Affecting Galaxy Distances and Evolutionary History.** *Donald H. Gudehus.* 382, 1, 200-A13 (1991)
- Large-Scale Peculiar Velocity Fields in Superclusters of Galaxies.** *G. Gavazzi, M. Scodellaggio, A. Boselli, & G. Trinchieri.* 382, 19, 200-C5 (1991)
- A Radio-quiet Galaxy at Redshift  $z = 3.409$ .** *D. A. Turnshek, F. Macchetto, M. V. Bencke, C. Hazard, W. B. Sparks, & R. G. McMahon.* 382, 26, 200-D1 (1991)
- The Galaxy Two-Point Correlation Function Down to  $V = 26$  Magnitudes on 0.5 Scales.** *Lyman W. Neuschaefer, Rogier A. Windhorst, & Alan Dressler.* 382, 32, 200-D12 (1991)
- Void Statistics of the CfA Redshift Survey.** *Michael S. Vogeley, Margaret J. Geller, & John P. Huchra.* 382, 44, 200-E12 (1991)

- Systematic Effects in Lens Inversions: N<sub>1</sub> Exact Models for 0957+561.** *Christopher S. Kochanek.* 382, 58, 200-G1 (1991)
- Are Quasar Redshifts Cosmological?** *Aronn Dar.* 382, L1, 205-A7 (1991)
- Scale-invariant Clustering in the Large-Scale Distribution of Galaxies.** *Luigi Guzzo, Angela Iovino, Guido Chincarini, Riccardo Giovanelli, & Martha P. Haynes.* 382, L5, 205-B1 (1991)
- Gauge-invariant Joining Conditions for Cosmological Perturbations.** *Jai-chen Hwang & Ethan T. Vishniac.* 382, 363, 206-B1 (1991)
- Physically Permitted Cosmological Models with Nonzero Cosmological Constant.** *M. Moles.* 382, 369, 206-B9 (1991)
- Precollapse Scale Invariance in Gravitational Instability.** *F. Moutarde, J.-M. Alimi, F. R. Bouchet, R. Pellat, & A. Ramani.* 382, 377, 206-C5 (1991)
- Constraints on Cosmological Models from the IRAS QDOT Survey Results.** *Changbom Park.* 382, L59, 211-B1 (1991)
- A Hydrodynamic Approach to Cosmology: Texture-seeded Cold Dark Matter and Hot Dark Matter Cosmogonies.** *R. Y. Cen, J. P. Ostriker, D. N. Spergel, & N. Turok.* 383, 1, 212-B1 (1991)
- Nonlinear Matter Clustering Properties of a Cold Dark Matter Universe.** *François R. Bouchet, Richard Schaeffer, & Marc Davis.* 383, 19, 212-C7 (1991)
- Deep Galactic Surveys and the Structure of the Universe.** *Olga E. Burak, Marek Demiański, & Andrej G. Doroshkevich.* 383, 41, 212-E1 (1991)
- Models of Voids in Elliptic Universes.** *A. Chamorro.* 383, 51, 212-F1 (1991)
- The Confinement and Cosmological Evolution of Extragalactic Radio Source Components.** *A. A. Ubachukwu, S. E. Okoye, & L. I. Onuora.* 383, 56, 212-F7 (1991)
- Hubble Spheres and Particle Horizons.** *Edward Harrison.* 383, 60, 212-G1 (1991)
- Microwave Background Anisotropies Implied by Large-Scale Galaxy Correlations: The Minimum of C(0) and Cosmological Parameters.** *A. Kashlinsky.* 383, L1, 219-A7 (1991)
- The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. I. Southern Clusters.** *J. R. Mould, L. Staveley-Smith, R. A. Schommer, G. D. Bothun, P. J. Hall, Ming Sheng Han, J. P. Huchra, J. Roth, W. Walsh, & A. E. Wright.* 383, 467, 220-B7 (1991)
- Phase Shifts in Gravitationally Evolving Density Fields.** *Barbara S. Ryden & Miri Gramann.* 383, L33, 226-B1 (1991)
- DARK MATTER**
- N-Body Simulation of Large-Scale Structures in  $\Lambda \neq 0$  Friedmann Models.** *Hugo Martel.* 366, 353, 7-C1 (1991)
- Bulk Flows, Shear, and the Great Attractor.** *Nick Kaiser.* 366, 388, 7-F1 (1991)
- Seeded Hot Dark Matter Models for Large-Scale Structure.** *Jens V. Villumsen, Robert J. Scherrer, & Edmund Bertschinger.* 367, 37, 12-D1 (1991)
- Modeling Galaxy Formation in Evolving Dark Matter Halos.** *Shaun Cole.* 367, 45, 12-E7 (1991)
- Hollow Galactic Halos of Fermionic Dark Matter.** *John P. Ralston & Lesley L. Smith.* 367, 54, 12-F4 (1991)
- A Technique for Using Radio Jets as Extended Gravitational Lensing Probes.** *Philipp P. Kronberg, Charles C. Dyer, E. Margaret Burbidge, & Vesa T. Junkkarinen.* 367, L1, 17-B1 (1991)
- The Galactic Disk Surface Mass Density and the Galactic Force  $K_z$  at  $z = 1.1$  Kiloparsecs.** *Konrad Kuijken & Gerard Gilmore.* 367, L9, 17-C1 (1991)
- Zero Central Density Solutions of the Anisotropic Jeans Equation and Neutrino Dark Matter.** *Jes Madson.* 367, 507, 19-F1 (1991)
- On the Observability of the Gamma-Ray Line Flux from Dark Matter Annihilation.** *S. Rudaz & F. W. Stecker.* 368, 406, 30-B5 (1991)
- Window for the Dark Matter Solution to the Solar Neutrino Problem.** *David Dearborn, Kim Griest, & Georg Raffelt.* 368, 626, 33-A1 (1991)
- Large-Aperture BVRJK Photometry of Rich Abell Clusters: Constraints on Dark Matter.** *Juan M. Uson & Stephen P. Boughn.* 369, 38, 36-D11 (1991)
- Filamentary Superclustering in a Universe Dominated by Cold Dark Matter.** *Michael J. West, Jens V. Villumsen, & Avishai Dekel.* 369, 287, 41-C7 (1991)
- Gravitational Lensing by Clusters of Galaxies: Constraining the Mass Distribution.** *Jordi Miralda-Escudé.* 370, 1, 47-B1 (1991)
- Compression of Dark Halos by Baryon Infall: Self-similar Solutions.** *Barbara S. Ryden.* 370, 15, 47-C1 (1991)
- Redshift-Space Correlation Functions in the Cold Dark Matter Scenario.** *Yasushi Suto & Tatsushi Sugiyohara.* 370, L15, 53-C7 (1991)
- Radiation-induced Reversal of Baryonic Perturbations.** *W. H. Zurek.* 370, 474, 54-C8 (1991)
- Bosons: Hot Dark Matter with Small-Scale Power.** *Jes Madson.* 371, L47, 73-A11 (1991)
- Further Limits on Disklike Dark Matter from K Dwarf Kinematics.** *Konrad Kuijken.* 372, 125, 75-E7 (1991)
- Limits on Cold Dark Matter Cosmologies from New Anisotropy Bounds on the Cosmic Microwave Background.** *Nicola Vittorio, Peter Meinhold, Pio Fráncisco Muciaccia, Philip Lubin, & Joseph Silk.* 372, L1, 79-A7 (1991)
- Gravitational Clustering in the Expanding Universe: Controlled High-Resolution Studies in Two Dimensions.** *John Francis Beacom, Kurt G. Dominik, Adrian L. Melott, Sam P. Perkins, & Sergei F. Shandarin.* 372, 351, 80-B7 (1991)
- New Model for the 0957+561 Gravitational Lens System: Bounds on Masses of a Possible Black Hole and Dark Matter and Prospects for Estimation of  $H_0$ .** *E. E. Falco, M. V. Gorenstein, & I. I. Shapiro.* 372, 364, 80-D1 (1991)
- Type Ia Supernovae: Constraints on Baryonic Dark Matter.** *Tammy A. Smecker & Rosemary F. G. Wyse.* 372, 448, 81-D1 (1991)
- Constraints on Open Universe Models from Quadrupole Anisotropy of the Cosmic Microwave Background.** *Naoteru Gouda, Naoshi Sugiyama, & Misao Sasaki.* 372, L49, 85-B1 (1991)
- Large-Scale Structure in a Texture-seeded Cold Dark Matter Cosmogony.** *Changbom Park, David N. Spergel, & Neil Turok.* 372, L53, 85-B5 (1991)
- Gravitational Microlensing as a Method of Detecting Disk Dark Matter and Faint Disk Stars.** *Kim Griest, Charles Alcock, Timothy S. Axelrod, David P. Bennett, Kem H. Cook, Kenneth C. Freeman, Hye-Sook Park, Saul Perlmutter, Bruce A. Peterson, Peter J. Quinn, Alexander W. Rodgers, & Christopher W. Stubbs (The MACHO Collaboration).* 372, L79, 85-D5 (1991)
- Background Correlation Functions from Galaxy Rotation Curves.** *Stefano Borgani, Silvio A. Bonometto, Massimo Persic, & Paolo Salucci.* 374, 20, 98-C7 (1991)
- Evolution of Velocity and Density Fields around Clusters of Galaxies.** *Per B. Lilje & Ofer Lahav.* 374, 29, 98-D3 (1991)
- Gravitational Lens Interference.** *J. B. Peterson & Toby Falk.* 374, L5, 103-C1 (1991)
- Galaxy Pairs in Redshift Catalogs as a Probe of Dark Matter.** *Jane C. Charlton & Edwin E. Salpeter.* 375, 517, 119-C1 (1991)
- Evidence for a Massive, Dark Gravitational Lensing Object in Q2345+007.** *Robert C. Duncan.* 375, L41, 124-B1 (1991)
- The Distribution of Dark Matter in the Perseus Cluster.** *C. J. Eyles, M. P. Watt, D. Bertram, M. J. Church, T. J. Ponman, G. K. Skinner, & A. Willmore.* 376, 23, 125-C12 (1991)
- Formation of Galactic Halos from Seeded Hot Dark Matter.** *Anthony van Dalen & Jens Verner Villumsen.* 376, 371, 131-B1 (1991)
- Winds, Outflows, and Inflows in X-Ray Elliptical Galaxies. I.** *Luca Ciotti, Annibale D'Ercole, Silvia Pellegrini, & Alvio Renzini.* 376, 380, 131-B12 (1991)
- The Fragmentation of "Pancakes" in a Dark Matter-dominated Universe.** *Wenbo Yuan, Joan M. Centrella, & Michael L. Norman.* 376, L29, 137-A11 (1991)
- A Critical Look at Cosmions.** *Jean Kaplan, François Martin de Volnay, Charling Tao, & Sylvaine Turck-Chièze.* 378, 315, 154-G11 (1991)
- Gravitational Lensing, Time Delay, and Angular Diameter Distance.** *Ramesh Narayan.* 378, L5, 157-B1 (1991)
- Dynamical Evolution of Topology of Large-Scale Structure.** *Changbom Park & J. Richard Gott III.* 378, 457, 158-B1 (1991)
- H I Studies of the Sculptor Group Galaxies. VII. Implications on the Distribution and Nature of Dark Matter in Groups.** *Daniel Puche & Claude Carignan.* 378, 487, 158-E1 (1991)
- The Structure of Cold Dark Matter Halos.** *John Dubinski & R. G. Carlberg.* 378, 496, 158-E11 (1991)

- Cosmological Velocity-Density Relation in the Quasi-linear Regime.** *Adi Nusser, Avishai Dekel, Edmund Bertschinger, & George R. Blumenthal.* 379, 6, 163-B7 (1991)
- The Dark Matter Content of Spiral Galaxies.** *Paolo Salucci, Keith M. Ashman, & Massimo Persic.* 379, 89, 164-B1 (1991)
- The Magnification of Stars Crossing a Caustic. I. Lenses with Smooth Potentials.** *Jordi Miralda-Escudé.* 379, 94, 164-B7 (1991)
- The Small-Scale Clustering Properties of Dwarf Galaxies.** *J. Patricia Vader & Allan Sandage.* 379, L1, 169-A8 (1991)
- Collapse of Population III Objects Induced by Cold Collisionless Dark Matter.** *J. C. N. de Araujo & R. Opher.* 379, 461, 170-D10 (1991)
- The Correlation Function of Galaxy Ellipticities Produced by Gravitational Lensing.** *Jordi Miralda-Escudé.* 380, 1, 176-B1 (1991)
- Anisotropies of the Cosmic Background Radiation in a "Hot" Dark Matter Universe.** *Peter Anninos, Richard A. Matzner, Robin Tuluie, & Joan Centrella.* 382, 71, 201-A1 (1991)
- Precollapse Scale Invariance in Gravitational Instability.** *F. Moutarde, J.-M. Alimi, F. R. Bouchet, R. Pellat, & A. Ramani.* 382, 377, 206-C5 (1991)
- A Hydrodynamic Approach to Cosmology: Texture-seeded Cold Dark Matter and Hot Dark Matter Cosmogonies.** *R. Y. Cen, J. P. Ostriker, D. N. Spergel, & N. Turok.* 383, 1, 212-B1 (1991)
- Nonlinear Matter Clustering Properties of a Cold Dark Matter Universe.** *François R. Bouchet, Richard Schaeffer, & Marc Davis.* 383, 19, 212-C7 (1991)
- Thin and Giant Luminous Arcs: A Strong Test of the Lensing Cluster Mass Distribution.** *F. Hammer.* 383, 66, 212-G8 (1991)
- Expectations for X-Ray Cluster Observations by the ROSAT Satellite.** *A. E. Evrard & J. P. Henry.* 383, 95, 213-C1 (1991)
- DENSE MATTER**
- Neutron Star Thermal Evolution.** *Kenneth A. Van Riper.* 75, 449, 6-G7 (1991)
- Explosion of a Rotating Neutron Star near the Minimum Mass.** *Monica Colpi, Stuart L. Shapiro, & Saul A. Teukolsky.* 369, 422, 43-A5 (1991)
- Steady State Energy Sources in Neutron Stars.** *Kenneth A. Van Riper.* 372, 251, 77-A13 (1991)
- Nuclear Reaction Rates in Dense Carbon-Oxygen Mixtures.** *Shuji Ogata, Hiroshi Iyetomi, & Setsuo Ichimaru.* 372, 259, 77-B9 (1991)
- Rotation of the Neutron-Drip Superfluid in Pulsars: The Interaction and Pinning of Vortices.** *P. B. Jones.* 373, 208, 88-E6 (1991)
- Accurate Collision Integrals for the Attractive Static Screened Coulomb Potential with Application to Electrical Conductivity.** *James MacDonald.* 76, 369, 29-F3 (1991)
- Mechanics and Energetics of Vortex Unpinning in Neutron Stars.** *Bennett K. Link & Richard I. Epstein.* 373, 592, 95-C11 (1991)
- Thermonuclear Reactions in Dense Stellar Matter: Electron Screening Revisited.** *Setsuo Ichimaru & Shuji Ogata.* 374, 647, 107-B5 (1991)
- Equation of State in a Strong Magnetic Field: Finite Temperature and Gradient Corrections.** *Andrew M. Abrahams & Stuart L. Shapiro.* 374, 652, 107-B12 (1991)
- The Shear Modulus of the Neutron Star Crust and Nonradial Oscillations of Neutron Stars.** *T. Strohmayer, S. Ogata, H. Iyetomi, S. Ichimaru, & H. M. Van Horn.* 375, 679, 121-B7 (1991)
- The Effects of Thermal Radiation on Some General Relativistic Stellar Models.** *J. M. Aguirregabiria, J. Ibáñez, A. Di Prisco, & L. Herrera.* 376, 662, 134-E8 (1991)
- Astrophysical Limits for Binding Energy of Strange Matter.** *M. I. Krivoruchenko & B. V. Martemyanov.* 378, 628, 160-C1 (1991)
- Superfluid Hydrodynamics in Rotating Neutron Stars. I. Nondissipative Equations.** *Gregory Mendell.* 380, 515, 184-F1 (1991)
- Superfluid Hydrodynamics in Rotating Neutron Stars. II. Dissipative Effects.** *Gregory Mendell.* 380, 530, 184-G3 (1991)
- Soft X-Ray Pulses from Neutron Star Glitches.** *Kenneth A. Van Riper, Richard I. Epstein, & Guy S. Miller.* 381, L47, 199-C1 (1991)
- Neutron Star Crustal Plate Tectonics. II. Evolution of Radio Pulsar Magnetic Fields.** *M. Ruderman.* 382, 576, 208-F4 (1991)
- Neutron Star Crustal Plate Tectonics. III. Cracking, Glitches, and Gamma-Ray Bursts.** *M. Ruderman.* 382, 587, 208-G3 (1991)
- The Rosseland Mean Free-Free Gaunt Factor of the Dense High-Temperature Stellar Plasma.** *Naoki Itoh, Fumiyoji Kuwashima, Koki Ichihashi, & Haruhiko Mutoh.* 382, 636, 209-E1 (1991)
- Cold Equation of State in a Strong Magnetic Field: Effects of Inverse  $\beta$ -Decay.** *Dong Lai & Stuart L. Shapiro.* 383, 745, 223-D11 (1991)
- DEUTERIUM**
- Fossil DCN in Orion-KL.** *Jeffrey G. Mangum, Richard L. Plambeck, & Alwyn Wootten.* 369, 169, 38-A11 (1991)
- Pure Rotational Spectrum of Hydrogen Deuteride by Far-Infrared Fourier Transform Spectroscopy.** *Lorenzo Uliivi, Paolo De Natale, & Massimo Inguscio.* 378, L29, 157-D7 (1991)
- DIFFUSION**
- A Crucial Test of the Diffusion Model: 53 Camelopardalis.** *J. Babel & G. Michaud.* 366, 560, 10-A5 (1991)
- Gravitational Diffusion of Solar System WIMPs.** *Andrew Gould.* 368, 610, 32-F7 (1991)
- Meridional Circulation and Diffusion in A and Early F Stars.** *Paul Charbonneau & Georges Michaud.* 370, 693, 57-A10 (1991)
- Lithium, Age, and Metallicity in Open Clusters.** *Ann Merchant Boesgaard.* 370, L95, 59-E12 (1991)
- Ambipolar Diffusion, Cloud Cores, and Star Formation: Two-dimensional, Cylindrically Symmetric Contraction. I. The Issues, Formulation of the Problem, and Method of Solution.** *Telemachos Ch. Mouschovias & Scott A. Morton.* 371, 296, 63-G1 (1991)
- Diffusion and Mixing of Lithium and Helium in Population II Dwarfs.** *Charles R. Proffitt & Georges Michaud.* 371, 584, 68-G1 (1991)
- A Simple Accretion/Diffusion Model for  $\lambda$  Bootis Stars.** *Paul Charbonneau.* 372, L33, 79-D13 (1991)
- Magnetic Braking, Ambipolar Diffusion, Cloud Cores, and Star Formation: Natural Length Scales and Protostellar Masses.** *Telemachos Ch. Mouschovias.* 373, 169, 88-B3 (1991)
- Consequences of Strong Pitch-Angle Diffusion of Particles in Solar Flares.** *P. A. Bespalov, V. V. Zaitsev, & A. V. Stepanov.* 374, 369, 102-F5 (1991)
- Flux-limited Diffusion in a Scattering Medium.** *Fulvio Melia & Gregory J. Zylstra.* 374, 732, 108-B9 (1991)
- Diffusion and Mixing in Classical Nova Precursors.** *Icko Iben, Jr., Masayuki Y. Fujimoto, & Jim MacDonald.* 375, L27, 117-D1 (1991)
- The Evolution of Discontinuities in Radiating Spheres in the Diffusion Approximation.** *W. Barreto, L. Herrera, & L. Núñez.* 375, 663, 121-A1 (1991)
- Suppression of Turbulent Transport by a Weak Magnetic Field.** *Fausto Cataneo & Samuel I. Vainstein.* 376, L21, 130-C6 (1991)
- The Effects of Thermal Radiation on Some General Relativistic Stellar Models.** *J. M. Aguirregabiria, J. Ibáñez, A. Di Prisco, & L. Herrera.* 376, 662, 134-E8 (1991)
- First Results from the Goddard High-Resolution Spectrograph: High-Resolution Observations of the 1942 Å Resonance Line of He II in the Chemically Peculiar B Star,  $\chi$  Lupi.** *David S. Leckrone, Glenn M. Wahlgren, & Sveneric G. Johansson.* 377, L37, 143-E1 (1991)
- Energy Balance in the Solar Transition Region. II. Effects of Pressure and Energy Input on Hydrostatic Models.** *J. M. Fontenla, E. H. Avrett, & R. Loeser.* 377, 712, 148-E1 (1991)
- Lithium in Halo Stars: Constraining the Effects of Helium Diffusion on Globular Cluster Ages and Cosmology.** *Constantine P. Deliyannis & Pierre Demarque.* 379, 216, 165-F7 (1991)
- Gravitational Settling in Solar Models.** *Charles R. Proffitt & Georges Michaud.* 380, 238, 179-A5 (1991)
- Subthreshold Stochastic Diffusion with Application to Selective Acceleration of  $^3\text{He}$  in Solar Flares.** *Spiliros Riyopoulos.* 381, 578, 197-G5 (1991)
- Implications of Helium Diffusion for Globular Cluster Isochrones and Luminosity Functions.** *Charles R. Proffitt & Don A. VandenBerg.* 77, 473, 51-C10 (1991)
- EARLY UNIVERSE**
- N-Body Simulation of Large-Scale Structures in  $\Lambda \neq 0$  Friedmann Models.** *Hugo Martel.* 366, 353, 7-C1 (1991)
- Microwave Distortions from Collapsing Domain-Wall Bubbles.** *Michael S. Turner, Richard Watkins, & Lawrence M. Widrow.* 367, L43, 22-B1 (1991)

- A Medium-Scale Measurement of the Cosmic Microwave Background at 3.3 Millimeters.** *Peter Meinhold & Philip Lubin.* 370, L11, 53-C1 (1991)
- Did the Universe Recombine?** *James G. Bartlett & Albert Stebbins.* 371, 8, 60-B9 (1991)
- Spectral Distortions of the Microwave Background Radiation Resulting from the Damping of Pressure Waves.** *R. A. Daly.* 371, 14, 60-C3 (1991)
- Preliminary Results from the COBE Differential Microwave Radiometers: Large Angular Scale Isotropy of the Cosmic Microwave Background.** *G. F. Smoot, C. L. Bennett, A. Kogut, J. Aymon, C. Backus, G. De Amici, K. Galuk, P. D. Jackson, P. Keegstra, L. Rokke, L. Tenorio, S. Torres, S. Gulkis, M. G. Hauser, M. A. Janssen, J. C. Mather, R. Weiss, D. T. Wilkinson, E. L. Wright, N. W. Boggess, E. S. Cheng, T. Kellogg, P. Lubin, S. Meyer, S. H. Moseley, T. L. Murdoch, R. A. Shafrazi, & R. F. Silverberg.* 371, L1, 66-A7 (1991)
- Cosmic Rays from Primordial Black Holes.** *Jane H. MacGibbon & B. J. Carr.* 371, 447, 67-B5 (1991)
- Signatures of Inhomogeneity in the Early Universe.** *Lawrence H. Kawano, William A. Fowler, Ralph W. Kavanagh, & Robert A. Malaney.* 372, 1, 74-A11 (1991)
- An Extreme Population II Dwarf without Lithium.** *L. M. Hobbs, D. E. Welty, & J. A. Thorburn.* 373, L47, 97-B13 (1991)
- The Lithium Abundance in Extreme Halo Stars.** *L. M. Hobbs & J. A. Thorburn.* 375, 116, 112-D8 (1991)
- Perturbations in a Singularity-free Cosmological Model.** *Mark Israelit & Nathan Rosen.* 375, 463, 118-E1 (1991)
- Perturbations in a Singularity-free Cosmological Model. II. The Synchronous Gauge.** *Mark Israelit.* 375, 473, 118-F1 (1991)
- Primordial Nucleosynthesis Redux.** *Terry P. Walker, Gary Steigman, David N. Schramm, Keith A. Olive, & Ho-Shik Kang.* 376, 51, 125-F1 (1991)
- A Search for Redshifted Neutral Hydrogen from Protoclusters of Galaxies.** *Juan M. Uson, Durgadas S. Bagri, & Timothy J. Cornwell.* 377, L65, 150-B1 (1991)
- First Detection of Beryllium in a Very Metal Poor Star: A Test of the Standard Big Bang Model.** *Gerard Gilmore, Bengt Edvardsson, & P. E. Nissen.* 378, 17, 151-C1 (1991)
- Baryon Isocurvature Scenario in Inflationary Cosmology: A Particle Physics Model and Its Astrophysical Implications.** *Jun'ichi Yokoyama & Yasushi Suto.* 379, 427, 170-B1 (1991)
- The Upper Bound to the Primordial Abundance of Helium and the Consistency of the Hot Big Bang Model.** *Keith A. Olive, Gary Steigman, & Terry P. Walker.* 380, L1, 181-B1 (1991)
- EARTH: ATMOSPHERE**
- Simulation of Effects of Atmospheric Seeing on the Observation of High-Degree Solar Oscillations.** *Frank Hill, Douglas Gough, William J. Merryfield, & Juri Toomre.* 369, 237, 38-G7 (1991)
- The Temperature of the Cosmic Microwave Background Radiation at 3.8 GHz: Results of a Measurement from the South Pole Site.** *Giovanni De Amici, Marco Bersanelli, Al Kogut, Steve Levin, Michele Limon, & George F. Smoot.* 381, 341, 193-C1 (1991)
- EARTH: GENERAL**
- Magnetic Field-aligned Electric Potentials in Nonideal Plasma Flows.** *K. Schindler, M. Hesse, & J. Birn.* 380, 293, 179-G9 (1991)
- Testing Einstein's Theory of Gravity by Analyzing Lunar Laser Ranging Data.** *J. Müller, M. Schneider, M. Soffel, & H. Ruder.* 382, L101, 211-E12 (1991)
- EDITORIALS AND NOTICES**
- Editorial: Changes to the Volume Index.** *Helmut A. Abt.* 366, 341, 7-B1 (1991)
- Dedication Statement to Lyman Spitzer.** *The HST Science Working Group.* 377, L1, 143-A3 (1991)
- Announcements: 1992 Rates and Supplement Volumes.** *Helmut A. Abt.* 381, 1, 189-A11 (1991)
- ELEMENTARY PARTICLES**
- Hollow Galactic Halos of Fermionic Dark Matter.** *John P. Ralston & Lesley L. Smith.* 367, 54, 12-F4 (1991)
- Neutrino Oscillations and the Leptonic Charge of the Universe.** *Martin J. Savage, Robert A. Malaney, & George M. Fuller.* 368, 1, 23-B1 (1991)
- Gravitational Diffusion of Solar System WIMPs.** *Andrew Gould.* 368, 610, 32-F7 (1991)
- Window for the Dark Matter Solution to the Solar Neutrino Problem.** *David Dearborn, Kim Griest, & Georg Raffelt.* 368, 626, 33-A1 (1991)
- Comptonization of Gamma Rays by Cold Electrons.** *Yueming Xu, Randy R. Ross, & Richard McCray.* 371, 280, 63-E11 (1991)
- Cosmic Rays from Primordial Black Holes.** *Jane H. MacGibbon & B. J. Carr.* 371, 447, 67-B5 (1991)
- Numerical Solution of the General Relativistic Boltzmann Equation for Massive and Massless Particles.** *Hugh Harleston & Katherine A. Holcomb.* 372, 225, 76-F13 (1991)
- Primordial Nucleosynthesis Redux.** *Terry P. Walker, Gary Steigman, David N. Schramm, Keith A. Olive, & Ho-Shik Kang.* 376, 51, 125-F1 (1991)
- Mayflower Mine 1500 GV Detector: Cosmic-Ray Anisotropy and Search for Cygnus X-3.** *D. J. Cutler & D. E. Groom.* 376, 322, 128-G12 (1991)
- Does the Solar Interior Rotate Rigidly?** *Andrew Gould.* 377, 707, 148-D7 (1991)
- Positron Annihilation in the Interstellar Medium.** *Nidal Guessoum, Reuven Ramay, & Richard E. Lingenfelter.* 378, 170, 153-B4 (1991)
- A Critical Look at Cosmions.** *Jean Kaplan, François Marin de Volnay, Charling Tao, & Sylvaine Turck-Chièze.* 378, 315, 154-G11 (1991)
- Astrophysical Limits for Binding Energy of Strange Matter.** *M. I. Krivoruchenko & B. V. Martemyanov.* 378, 628, 160-C1 (1991)
- Baryon Isocurvature Scenario in Inflationary Cosmology: A Particle Physics Model and Its Astrophysical Implications.** *Jun'ichi Yokoyama & Yasushi Suto.* 379, 427, 170-B1 (1991)
- Compton Backscattered 511 keV Annihilation Line Emission and the 170 keV Line from the Galactic Center Direction.** *Richard E. Lingenfelter & Xin-Min Hua.* 381, 426, 196-A10 (1991)
- Interplanetary Transport of Decay Protons from Solar Flare Neutrons.** *D. Ruffolo.* 382, 688, 210-B12 (1991)
- Effects of Negatively Charged Massive Particles on Primordial Stars.** *R. N. Boyd & G. M. Fuller.* 383, 615, 221-G12 (1991)
- EQUATION OF STATE**
- Structure and Stability of Rotating Relativistic Neutron Stars.** *F. Weber, N. K. Glendenning, & M. K. Weigel.* 373, 579, 95-B10 (1991)
- Equation of State in a Strong Magnetic Field: Finite Temperature and Gradient Corrections.** *Andrew M. Abrahams & Stuart L. Shapiro.* 374, 652, 107-B12 (1991)
- Equation of State in Metals and Cold Stars: Evaluation of Statistical Models.** *Dong Lai, Andrew M. Abrahams, & Stuart L. Shapiro.* 377, 612, 147-C10 (1991)
- On Equation of State Interpolation Errors in Stellar Interior Calculations.** *Ben Dorman, Alan W. Irwin, & Brian B. Pedersen.* 381, 228, 191-G4 (1991)
- Effects of Opacity and Equation of State on Solar Structure and Oscillations.** *Joyce A. Guzik & Arthur N. Cox.* 381, 333, 193-B5 (1991)
- ERRATA, ADDENDA, AND CORRIGENDA**
- The Mass of the Classical Cepheid SU Cygni: Erratum.** *Nancy Remage Evans & C. T. Bolton.* 366, 340, 5-C7 (1991) (Orig. paper in 356, 630, 108-A12 (1990))
- Hard X-Rays from Coma Cluster Region: Erratum.** *A. Bazzano, R. Fusco-Femiano, P. Ubertini, F. Perotti, E. Quadrini, A. J. Court, A. J. Dean, N. A. Dipper, R. Lewis, & J. B. Stephen.* 366, L95, 11-F1 (1991) (Orig. paper in 362, L51, 181-C1 (1990))
- Infrared Emissions of  $H_3^+$  in the Atmosphere of Jupiter in the 2.1 and 4.0 Micron Region: Erratum.** *Steven Miller, Robert D. Joseph, & Jonathan Tennyson.* 367, L37, 17-F1 (1991) (Orig. paper in 360, L55, 156-E1 (1990))
- Hot Gas in the Nucleus of M82:  $^{12}\text{CO}$  and  $^{13}\text{CO}$  J = 3–2 Observations.** *Jean L. Turner, Robert N. Martin, & Paul T. P. Ho.* 367, 677, 21-F6 (1991) (Orig. paper in 351, 418, 45-C5 (1990))
- The Kinematics of Abell Clusters: Erratum.** *Ann I. Zabludoff, John P. Huchra, & Margaret J. Geller.* 75, 629, 9-C13 (1991) (Orig. paper in 74, 1, 30-B1 (1990))
- Gravitational Radiation from the Galaxy.** *D. Hils, P. L. Bender, & R. E. Webbink.* 369, 271, 39-C9 (1991) (Orig. paper in 360, 75, 146-A6 (1990))

- Consequences of Relativistic Proton Injection in Active Galactic Nuclei:** Erratum. *Mitchell C. Begelman, Bronishaw Rudak, & Marek Sikora.* 370, 791, 58-D1 (1991) (Orig. paper in 362, 38, 169-E3 (1990))
- Supernova Rates and Galaxy Inclinations:** Erratum. *Sidney van den Bergh & Robert D. McClure.* 371, 443, 65-F3 (1991) (Orig. paper in 359, 277, 139-D13 (1990))
- The Dark Halo of the Polar-Ring Galaxy NGC 4650A:** Erratum. *Penny D. Sackett & Linda S. Sparke.* 371, 443, 65-F3 (1991) (Orig. paper in 361, 408, 163-B11 (1990))
- Nonlinear Development of the Kink Instability in Coronal Flux Tubes:** Erratum. *I. J. D. Craig & A. D. Sneyd.* 371, 443, 65-F3 (1991) (Orig. paper in 357, 653, 120-F5 (1990))
- Extended X-Ray Emission in Nearby Seyfert Galaxies:** Erratum. *Martin Elvis, C. Fassnacht, A. S. Wilson, & U. Briel.* 371, 820, 71-F12 (1991) (Orig. paper in 361, 459, 163-G1 (1990))
- Beams Crossing a Galactic Halo–Intergalactic Medium Interface and the Size of Extragalactic Radio Sources:** Erratum. *Alexander Rosen & Paul J. Wiita.* 372, 349, 78-C7 (1991) (Orig. paper in 330, 16, 90-B11 (1988))
- The Molecular Gas Content of the Nuclear Region of M33:** Erratum. *Christine D. Wilson & Nick Scoville.* 372, 349, 78-C7 (1991) (Orig. paper in 347, 743, 192-E7 (1989))
- Molecular and Atomic Hydrogen Line Emission from Star-forming Galaxies:** Erratum. *P. J. Puxley, T. G. Hawarden, & C. M. Mountain.* 372, 733, 84-F13 (1991) (Orig. paper in 364, 77, 195-A1 (1990))
- Excitation of Millimeter and Submillimeter Water Masers:** Erratum. *David A. Neufeld & Gary J. Melnick.* 374, 784, 108-G4 (1991) (Orig. paper in 368, 215, 25-F11 (1991))
- Galaxy Velocity Dispersions Using a Cross-Correlation Method:** Erratum. *Cristina Dalle Ore, S. M. Faber, J. Jesús Gonzalez, Roland Stoughton, & David Burstein.* 375, 427, 116-B12 (1991) (Orig. paper in 366, 38, 1-E5 (1991))
- Extended Stellar Hydrodynamics for Galactic Disks:** Erratum. *Peter Amend & Phil Cuddeford.* 375, 427, 116-B12 (1991) (Orig. paper in 368, 79, 24-B1 (1991))
- Conformally Symmetric Spheres in the Thin Wall Approximation:** Erratum. *L. Herrera, J. Ibáñez, & A. Di Prisco.* 376, 367, 129-D12 (1991) (Orig. paper in 353, 579, 71-B4 (1990))
- Pycnonuclear Fusion Rates:** Erratum. *S. Schramm & S. E. Koonin.* 377, 343, 142-B12 (1991) (Orig. paper in 365, 296, 210-B1 (1990))
- Studies of H I and D I in the Local Interstellar Medium:** Erratum. *J. Murthy, R. C. Henry, H. W. Moos, A. Vidal-Madjar, J. L. Linsky, & C. Gry.* 378, 455, 156-E8 (1991) (Orig. paper in 356, 223, 101-G5 (1990))
- The Far-Infrared Morphology of the Double-ringed Spiral Galaxy NGC 4736 (M94): A Ring Surrounding an Extended Nucleus:** Erratum. *Beverly J. Smith, D. F. Lester, P. M. Harvey, & R. W. Pogge.* 380, 677, 186-E6 (1991) (Orig. paper in 373, 66, 86-G5 (1991))
- A Redshift Survey of IRAS Galaxies. II. Methods for Determining Self-consistent Velocity and Density Fields:** Erratum. *Amos Yahil, Michael A. Strauss, Marc Davis, & John P. Huchra.* 381, 348, 193-C10 (1991) (Orig. paper in 372, 380, 80-E5 (1991))
- Seeded Hot Dark Matter Models for Large-Scale Structure:** Erratum. *Jens V. Villumsen, Robert J. Scherrer, & Edmund Bertschinger.* 381, 601, 198-C1 (1991) (Orig. paper in 367, 37, 12-D11 (1991))
- Signatures of Inhomogeneity in the Early Universe:** Erratum. *Lawrence H. Kawano, William A. Fowler, Ralph W. Kavanagh, & Robert A. Malaney.* 382, 358, 204-E13 (1991) (Orig. paper in 372, 1, 74-A11 (1991))
- Surface Brightness Fluctuations: A Bridge from M31 to the Hubble Constant:** Erratum. *John L. Tonry.* 382, L109, 211-F9 (1991) (Orig. paper in 373, L1, 91-A8 (1991))
- Strangeness Condensation, Nucleon Superfluidity, and Cooling of Neutron Stars:** Erratum. *Dany Page & E. Baron.* 382, L111, 211-F12 (1991) (Orig. paper in 354, L17, 80-C1 (1990))
- Terminal Velocities for a Large Sample of O Stars, B Supergiants, and Wolf-Rayet Stars:** Erratum. *Raman K. Prinja, M. J. Barlow, & Ian D. Howarth.* 383, 466, 218-B1 (1991) (Orig. paper in 379, 734, 173-G8 (1991))
- Gravitational Microlensing of High-Redshift Supernovae by Compact Objects:** Erratum. *Kevin P. Rauch.* 383, 466, 218-B1 (1991) (Orig. paper in 374, 83, 99-A11 (1991))
- FUNDAMENTAL CONSTANTS**
- Testing Einstein's Theory of Gravity by Analyzing Lunar Laser Ranging Data:** *J. Müller, M. Schneider, M. Soffel, & H. Ruder.* 382, L101, 211-E12 (1991)
- GALAXIES: ABUNDANCES**
- Chemical Evolution with Bursts of Star Formation: Element Ratios in Dwarf Galaxies:** *Gerard Gilmore & Rosemary F. G. Wye.* 367, L55, 22-C1 (1991)
- Extragalactic Globular Clusters. II. The M31 Globular Cluster System:** *John P. Huchra, Jean P. Brodie, & Stephen M. Kent.* 370, 495, 54-E5 (1991)
- High Chemical Abundances in Virgo Spiral Galaxies?** *Gregory A. Shields, Evan D. Skillman, & Robert C. Kennicutt, Jr.* 371, 82, 61-B1 (1991)
- Photoerosion and the Abundances of  $^7\text{Li}$ ,  $^9\text{Be}$ ,  $^{10}\text{B}$ , and  $^{11}\text{B}$  near Active Galactic Nuclei:** *R. N. Boyd & H. S. Fencl.* 373, 84, 87-A13 (1991)
- Hot Gas Metallicity and the History of Supernova Activity in Elliptical Galaxies:** *Michael Loewenstein & William G. Mathews.* 373, 445, 93-D11 (1991)
- Abundance Gradients and Galaxy Formation:** *M. Stiavelli & F. Matteucci.* 377, L79, 150-C9 (1991)
- GALAXIES: CLUSTERING**
- A Model for the Evolution of Large Density Perturbations: Normalization and Predictions:** *E. Martínez-González & J. L. Sanz.* 366, 1, 1-A11 (1991)
- Galaxies Clustering around QSOs with  $z = 0.9\text{--}1.5$  and the Origin of Blue Field Galaxies:** *Paul Hintzen, W. Romanishin, & Francisco Valdes.* 366, 7, 1-B5 (1991)
- N-Body Simulation of Large-Scale Structures in  $\Lambda \neq 0$  Friedmann Models:** *Hugo Martel.* 366, 353, 7-C1 (1991)
- On the "Mixing" of Self-gravitating Systems in a Cosmological Context:** *Henry E. Kandrup.* 366, 384, 7-E7 (1991)
- Bulk Flows, Shear, and the Great Attractor:** *Nick Kaiser.* 366, 388, 7-F1 (1991)
- The Luminosity-Diameter Relation for Disk Galaxies in Different Environments:** *M. Girardi, A. Biviano, G. Giuricin, F. Mardirossian, & M. Mezzetti.* 366, 393, 7-F7 (1991)
- A Straight Gravitational Image in Abell 2390: A Striking Case of Lensing by a Cluster of Galaxies:** *Roser Pelló, Jean-François Le Borgne, Geneviève Soucail, Yannick Mellier, & Blai Sanahuja.* 366, 405, 7-G9 (1991)
- X-Ray Luminosity Functions of Clusters of Galaxies:** *A. Cavaliere, R. Burg, & R. Giacconi.* 366, L61, 11-B11 (1991)
- A Change in the Cluster Environments of Radio Galaxies with Cosmic Epoch:** *G. J. Hill & S. J. Lilly.* 367, 1, 12-A13 (1991)
- Seeded Hot Dark Matter Models for Large-Scale Structure:** *Jens V. Villumsen, Robert J. Scherrer, & Edmund Bertschinger.* 367, 37, 12-D11 (1991)
- On the Interpretation of the Morphology-Density Relation for Galaxies in Clusters:** *Bradley C. Whitmore & Diane M. Gilmore.* 367, 64, 12-G1 (1991)
- The Metal Abundance and Specific Energy of Intracluster Gas:** *Raymond E. White III.* 367, 69, 12-G8 (1991)
- Dynamical Biases in Gravitational Clustering:** *R. G. Carlberg.* 367, 385, 18-C1 (1991)
- Comparison of Likely Candidate Models for Abell Cluster Structures against the Observed Distribution:** *David J. Batuski, Adrian L. Melott, Robert J. Scherrer, & Edmund Bertschinger.* 367, 393, 18-C11 (1991)
- X-Ray Continuum and Evidence for an Iron Emission Line from the Quasar E1821+643:** *T. Küi, O. R. Williams, T. Ohashi, H. Awaki, K. Hayashida, H. Inoue, H. Kondo, K. Koyama, F. Makino, K. Makishima, R. D. Saxon, G. C. Stewart, S. Takano, Y. Tanaka, & M. J. L. Turner.* 367, 455, 19-A11 (1991)
- The Angular Correlation Function of Galaxies from POSS-II:** *Alain Picard.* 368, L7, 28-B7 (1991)
- Dissipationless Collapse in an Expanding Universe:** *Neal Katz.* 368, 325, 29-B4 (1991)
- Numerical Study of a Perturbed Einstein-de Sitter Cosmological Model:** *H. V. Fagundes & S. F. Kwok.* 368, 337, 29-C4 (1991)

- Stripped Interstellar Gas in Cluster Cooling Flows. *Noam Soker, Joel N. Bregman, & Craig L. Sarazin.* 368, 341, 29-C10 (1991)
- Mesh-refined P<sup>3</sup>M: A Fast Adaptive N-Body Algorithm. *H. M. P. Couchman.* 368, L23, 35-A11 (1991)
- The Supergalactic Plane Redshift Survey. *Alan Dressler.* 75, 241, 4-C1 (1991)
- A New Survey for Quasar Clustering. *Patrick S. Osmer & Paul C. Hewett.* 75, 273, 4-E9 (1991)
- Cluster Infall with Friction. *R. G. Carlberg & John Dubinski.* 369, 13, 36-B11 (1991)
- Universe with Oscillating Expansion Rate. *Masahiro Morikawa.* 369, 20, 36-C5 (1991)
- Scaling Invariance in the Galaxy Distribution. II. Spatial and Luminosity Effects. *Sophie Maurogordato & Marc Lachièze-Rey.* 369, 30, 36-D1 (1991)
- Large-Aperture BVRJK Photometry of Rich Abell Clusters: Constraints on Dark Matter. *Juan M. Uson & Stephen P. Boughn.* 369, 38, 36-D11 (1991)
- Diffuse Light in Dense Clusters of Galaxies. I. R-Band Observations of Abell 2029. *Juan M. Uson, Stephen P. Boughn, & Jeffrey R. Kuhn.* 369, 46, 36-E7 (1991)
- Cooling Flows and the Formation of Massive Halos in cD Galaxies. *Andrea H. Prestwich & Marshall Joy.* 369, L1, 40-A7 (1991)
- Measures of Large-Scale Structure in the CfA Redshift Survey Slices. *Valérie de Lapparent, Margaret J. Geller, & John P. Huchra.* 369, 273, 41-B5 (1991)
- Filamentary Superclustering in a Universe Dominated by Cold Dark Matter. *Michael J. West, Jens V. Villumsen, & Avishai Dekel.* 369, 287, 41-C7 (1991)
- Self-Organization of Cosmic Radiation Pressure Instability. *Craig J. Hogan.* 369, 300, 41-D8 (1991)
- Gravitational Lensing by Clusters of Galaxies: Constraining the Mass Distribution. *Jordi Miralda-Escudé.* 370, 1, 47-B1 (1991)
- Northern Dwarf and Low Surface Brightness Galaxies. IV. The Large-Scale Space Distribution. *Trinh X. Thuan, Jean-Michel Alimi, J. Richard Gott III, & Stephen E. Schneider.* 370, 25, 47-D1 (1991)
- The Joint Far-Infrared—Optical Luminosity Function for Spiral Galaxies and Data for the Abell 400 and Cancer Clusters. *Edvige Corbelli, Edwin E. Salpeter, & John M. Dickey.* 370, 49, 47-F4 (1991)
- Redshift-Space Correlation Functions in the Cold Dark Matter Scenario. *Yasushi Suto & Tatsushi Sugino.* 370, L15, 53-C7 (1991)
- Cosmological N-Body Simulations with a Tree Code: Fluctuations in the Linear and Nonlinear Regimes. *Tatsushi Sugino, Yasushi Suto, François R. Bouchet, & Lars Hernquist.* 75, 631, 10-B1 (1991)
- The Surface Brightness Test for the Expansion of the Universe. III. Reduction of Data for the Several Brightest Galaxies in Clusters to Standard Conditions and a First Indication That the Expansion Is Real. *Allan Sandage & Jean-Marc Perelmutter.* 370, 455, 54-B1 (1991)
- Correlation Function of Gravitational Deflection Angles of Light Paths. *Kazuya Watanabe & Kenji Tomita.* 370, 481, 54-D1 (1991)
- Dust from Early Galaxies and the X-Ray Background Radiation. *B. Rudak & P. Mészáros.* 371, 29, 60-D5 (1991)
- Quasars and Active Galactic Nuclei in Rich Environments. II. The Evolution of Radio-loud Quasars. *E. Ellingson, H. K. C. Yee, & R. F. Green.* 371, 49, 60-F7 (1991)
- High Chemical Abundances in Virgo Spiral Galaxies? *Gregory A. Shields, Evan D. Skillman, & Robert C. Kennicutt, Jr.* 371, 82, 61-B1 (1991)
- A Long-lasting Compact Group. *Fabio Governato, Rajiv Bhatia, & Guido Chincarini.* 371, L15, 66-C1 (1991)
- Statistics of Peaks in Cosmological Nonlinear Density Fields. *Tatsushi Sugino & Yasushi Suto.* 371, 470, 67-D1 (1991)
- Peculiar Cluster Velocities from Measurements of the Kinematic Sunyaev-Zeldovich Effect. *Yoel Rephaeli & Ofer Lahav.* 372, 21, 74-C7 (1991)
- On Magnetothermal Instability in Cluster Cooling Flows. *Steven A. Balbus.* 372, 25, 74-C13 (1991)
- On the Population of H I Dwarf Galaxies. *David H. Weinberg, Arpad Szomoru, P. Guhathakurta, & J. H. van Gorkom.* 372, L13, 79-B11 (1991)
- Gravitational Clustering in the Expanding Universe: Controlled High-Resolution Studies in Two Dimensions. *John Francis Beacom, Kurt G. Dominik, Adrian L. Melott, Sam P. Perkins, & Sergei F. Shandarin.* 372, 351, 80-B7 (1991)
- A Measurement of the Mass Fluctuation Spectrum from the Cluster X-Ray Temperature Function. *J. Patrick Henry & Keith A. Arnaud.* 372, 410, 80-G11 (1991)
- The Influence of High-Density Environment on the Radio—Far-Infrared Correlation of Spiral Galaxies. *T. K. Menon.* 372, 419, 81-A7 (1991)
- Large-Scale Structure in a Texture-seeded Cold Dark Matter Cosmogony. *Changbom Park, David N. Spergel, & Neil Turok.* 372, L53, 85-B5 (1991)
- Evidence for Structure in the Distribution of Active Galactic Nuclei with  $z < 0.05$ . *Michael J. Longo.* 372, L59, 85-B11 (1991)
- The Correlation Function of cD Clusters. *Michael J. West & Sidney van den Bergh.* 373, 1, 86-B1 (1991)
- The Luminosity Distribution of Globular Clusters in Three Giant Virgo Ellipticals. *William E. Harris, J. W. B. Allwright, Christopher J. Pritchet, & Sidney van den Bergh.* 76, 115, 25-D11 (1991)
- Optical Properties and Dynamics of Galaxies in the Hickson Compact Groups. *Vera C. Rubin, Deidre A. Hunter, & W. Kent Ford, Jr.* 76, 153, 26-A1 (1991)
- Luminosity Segregation as an Indication of Dynamical Evolution in Rich Clusters of Galaxies. *G. Yepes, R. Dominguez-Tenreiro, & R. del Pozo-Sanz.* 373, 336, 92-B13 (1991)
- H I Mapping of Galaxies in the Cluster A1367. *John M. Dickey & Giuseppe Gavazzi.* 373, 347, 92-C12 (1991)
- Background Correlation Functions from Galaxy Rotation Curves. *Stefano Borgani, Silvio A. Bonometto, Massimo Persic, & Paolo Salucci.* 374, 20, 98-C7 (1991)
- Evolution of Velocity and Density Fields around Clusters of Galaxies. *Per B. Lilje & Ofer Lahav.* 374, 29, 98-D3 (1991)
- H I Deficiency in Cluster Spiral Galaxies: Dependence on Galaxy Size. *Monica Valluri & Chanda J. Jog.* 374, 103, 99-C7 (1991)
- Reconstructing the Primordial Spectrum of Fluctuations of the Universe from the Observed Nonlinear Clustering of Galaxies. *A. J. S. Hamilton, P. Kumar, Edward Lu, & Alex Mathews.* 374, L1, 103-B7 (1991)
- Superposition and Incompleteness Effects in Abell's Statistical Sample of Clusters. *Mitchell F. Struble & Herbert J. Rood.* 374, 395, 104-B5 (1991)
- Infrared Emission in Paired Galaxies. II. Luminosity Functions and Far-Infrared Properties. *Cong Xu & Jack W. Sulentic.* 374, 407, 104-C5 (1991)
- Quasars and Active Galactic Nuclei in Rich Environments. I. Fields Surrounding Optically Faint Quasars. *E. Ellingson, H. K. C. Yee, & R. F. Green.* 76, 455, 31-D2 (1991)
- Fundamental Parameters of Brightest Cluster Galaxies. *William R. Oegerle & John G. Hoessel.* 375, 15, 111-B13 (1991)
- Fourier Spectra of Three-dimensional Data. *David J. Baumgart & J. N. Fry.* 375, 25, 111-C11 (1991)
- Ram-Pressure Stripping of the Multiphase Interstellar Medium of the Virgo Cluster Elliptical Galaxy M86 (NGC 4406). *David A. White, A. C. Fabian, W. Forman, C. Jones, & C. Stern.* 375, 35, 111-D9 (1991)
- Non-Gaussian Temperature Fluctuations in the Cosmic Microwave Background Sky from a Random Gaussian Density Field. *Roberto Scaramella & Nicola Vittorio.* 375, 439, 118-C1 (1991)
- Formation and Distortion of Optical Rings around Rich Cluster Galaxies. *Christopher S. Kochanek & Roger D. Blandford.* 375, 492, 118-G11 (1991)
- Galaxy Pairs in Redshift Catalogs as a Probe of Dark Matter. *Jane C. Charlton & Edwin E. Salpeter.* 375, 517, 119-C1 (1991)
- Optical Coronal Emission Lines from Cooling Flows in Elliptical Galaxies and Galaxy Clusters. *Craig L. Sarazin & Christopher M. Graney.* 375, 532, 119-D3 (1991)
- The Accuracy of Galaxy Masses from the Timing Argument. *T. L. Kroeker & R. G. Carlberg.* 376, 1, 125-B1 (1991)

- The Distance to the Coma Cluster Using the B-Band Tully-Fisher Relation.** *M. Fukugita, S. Okamura, K. Tarusawa, H. J. Rood, & B. A. Williams.* 376, 8, 125-B9 (1991)
- The Distribution of Dark Matter in the Perseus Cluster.** *C. J. Eyles, M. P. Watt, D. Bertram, M. J. Church, T. J. Ponman, G. K. Skinner, & A. P. Willmore.* 376, 23, 125-C12 (1991)
- Superclusters and Pencil-Beam Surveys: The Origin of Large-Scale Periodicity.** *Neta A. Bahcall.* 376, 43, 125-E6 (1991)
- Dynamics of the Microwave-Decrement Cluster Abell 665.** *William R. Oegerle, Michael J. Fitchett, John M. Hill, & Paul Hintzen.* 376, 46, 125-E10 (1991)
- The Distribution of Clusters of Galaxies within 300 Mpc  $h^{-1}$  and the Crossover to an Isotropic and Homogeneous Universe.** *Roberto Scaramella, Giampaolo Vettolani, & Giovanni Zamorani.* 376, L1, 130-A7 (1991)
- Gravitational Clustering of Gaussian Density Fluctuations and the Origin of Hierarchy Correlations.** *A. Kashlinsky.* 376, L5, 130-B1 (1991)
- Extremely Low Surface Brightness Galaxies in the Fornax Cluster: Properties, Stability, and Luminosity Fluctuations.** *Gregory D. Bothun, Christopher D. Impey, & David F. Malin.* 376, 404, 131-D10 (1991)
- The X-Ray Cooling Flow in the Cluster of Galaxies around PKS 2354-35.** *Daniel A. Schwartz, Hale V. Bradt, Ronald A. Remillard, & I. R. Tuohy.* 376, 424, 131-F6 (1991)
- The Merging Runaway.** *A. Cavaliere, S. Colafrancesco, & N. Menci.* 376, L37, 137-B10 (1991)
- The Evolution of Void-filled Cosmological Structures.** *Enikő Regős & Margaret J. Geller.* 377, 14, 138-C1 (1991)
- A Quantitative Measure of Phase Correlations in Density Fields.** *Robert J. Scherrer, Adrian L. Melott, & Sergei F. Shandarin.* 377, 29, 138-D5 (1991)
- The Peculiar Velocity Field in the Hercules Region.** *Wolfram Freudling, Hugo Martel, & Martha P. Haynes.* 377, 349, 144-B12 (1991)
- Narrow-Band Photometry and the Evolution of Galaxies. III. The Intermediate-Redshift Sample.** *Karl D. Rakos, James M. Schombert, & Tobias J. Kreidl.* 377, 382, 144-E7 (1991)
- An X-Ray and Radio Study of Steep-Spectrum Radio Sources. II. Four Fields from a 22 MHz Polar Cap Survey.** *P. E. Dewdney, C. H. Costain, I. McHardy, A. G. Willis, D. E. Harris, & C. P. Stern.* 76, 1055, 40-D1 (1991)
- Scales of Structures and Homogeneity in the Universe.** *Peter Schuecker & Heinz-Albert Ott.* 378, L1, 157-A7 (1991)
- Dynamical Evolution of Topology of Large-Scale Structure.** *Changbom Park & J. Richard Gott III.* 378, 457, 158-B1 (1991)
- Models of Voids in the Expanding Universe. II.** *W. B. Bonnor & A. Chamorro.* 378, 461, 158-B7 (1991)
- Clusters of Galaxies Associated with Quasars. II. Galaxy Cluster Dynamics.** *E. Ellingson, R. F. Green, & H. K. C. Yee.* 378, 476, 158-D1 (1991)
- H I Studies of the Sculptor Group Galaxies. VII. Implications on the Distribution and Nature of Dark Matter in Groups.** *Daniel Puche & Claude Carignan.* 378, 487, 158-E1 (1991)
- Do Clusters of Galaxies Affect the Spectrum of the Microwave Background?** *M. Markevitch, G. R. Blumenthal, W. Forman, C. Jones, & R. A. Sunyaev.* 378, L33, 162-D1 (1991)
- Cross-Correlation of the X-Ray Background with Nearby Galaxies.** *Keith Jahoda, Ofer Lahav, Richard F. Mushotzky, & Elihu Boldt.* 378, L37, 162-D7 (1991)
- Cosmological Velocity-Density Relation in the Quasi-linear Regime.** *Adi Nusser, Avishai Dekel, Edmund Bertschinger, & George R. Blumenthal.* 379, 6, 163-B7 (1991)
- Superclustering at High Redshifts.** *Michael J. West.* 379, 19, 163-C7 (1991)
- Galaxy Formation through Hierarchical Clustering.** *Simon D. M. White & Carlos S. Frenk.* 379, 52, 163-F3 (1991)
- Detection of Excess Rotation Measure Due to Intracluster Magnetic Fields in Clusters of Galaxies.** *K.-T. Kim, Peter C. Tribble, & P. P. Kronberg.* 379, 80, 164-A5 (1991)
- The Magnification of Stars Crossing a Caustic. I. Lenses with Smooth Potentials.** *Jordi Miralda-Escudé.* 379, 94, 164-B7 (1991)
- The Small-Scale Clustering Properties of Dwarf Galaxies.** *J. Patricia Vader & Allan Sandage.* 379, L1, 169-A8 (1991)
- Excursion Set Mass Functions for Hierarchical Gaussian Fluctuations.** *J. R. Bond, S. Cole, G. Efstathiou, & N. Kaiser.* 379, 440, 170-C1 (1991)
- A Measurement of the Value of the Hubble Constant from the X-Ray Properties and the Sunyaev-Zel'dovich Effect of Abell 665.** *M. Birkinshaw, J. P. Hughes, & K. A. Arnaud.* 379, 466, 170-E1 (1991)
- Power-Spectrum Analysis of One-dimensional Redshift Surveys.** *N. Kaiser & J. A. Peacock.* 379, 482, 170-F5 (1991)
- Small-Scale Fluctuations and Angular Correlations of the X-Ray Background in the HEAO 1 A-2 Energy Band: Constraints on Clustering of X-Ray Sources.** *J. M. Martin-Moreno, G. De Zotti, E. A. Boldt, F. E. Marshall, L. Danese, A. Franceschini, & M. Persic.* 379, 507, 171-A4 (1991)
- Vacuum Ultraviolet Imagery of the Virgo Cluster Region. III. Diffuse Far-Ultraviolet Radiation at High Galactic Latitudes.** *Takashi Onaka & Keiichi Kodaira.* 379, 532, 171-C5 (1991)
- The Correlation Function of Galaxy Ellipticities Produced by Gravitational Lensing.** *Jordi Miralda-Escudé.* 380, 1, 176-B1 (1991)
- The Mass Distribution of Groups and Clusters of Galaxies.** *A. Cavaliere, S. Colafrancesco, & R. Scaramella.* 380, 15, 176-C1 (1991)
- Galaxy Correlations, Counts, and Moments.** *P. Carruthers.* 380, 24, 176-C11 (1991)
- The Luminosity Function of Compact Groups of Galaxies.** *Cláudia Mendes de Oliveira & Paul Hickson.* 380, 30, 176-D5 (1991)
- Constrained Realizations of Gaussian Fields: A Simple Algorithm.** *Yehuda Hoffman & Erez Ribak.* 380, L5, 181-B6 (1991)
- The Origin of Quasar Correlations.** *Neta A. Bahcall & Arati Chokshi.* 380, L9, 181-B11 (1991)
- The Scale Dependence of Galaxy Distribution Functions.** *William C. Saslaw & Philippe Crane.* 380, 315, 182-C1 (1991)
- Spectroscopy of the Gravitational Arcs in Cl 2244-02, A370 (Arclet A5), and Cl 0024+1654.** *Yannick Mellier, Bernard Fort, Geneviève Soucail, Guy Mathez, & Mireille Cailloux.* 380, 334, 182-D10 (1991)
- Turbulently Generated Magnetic Fields in Clusters of Galaxies.** *Itzhak Goldman & Yoel Rephaeli.* 380, 344, 182-E8 (1991)
- The Clustering of Faint Galaxies.** *G. Efstathiou, G. Bernstein, N. Katz, J. A. Tyson, & P. Guhathakurta.* 380, L47, 188-B1 (1991)
- Galaxy Evolution in Distant, X-Ray-Selected Clusters of Galaxies. I. Cl 1358+6245.** *Daniel G. Fabricant, Jeffrey E. McClintock, & Marshall W. Bautz.* 381, 33, 189-D8 (1991)
- Probing the Galactic Halo along the 3C 273 Sight Line Using IUE.** *Geoffrey S. Burks, Donald G. York, J. Chris Blades, Ralph C. Bohlin, & Willem Wamsteker.* 381, 55, 189-F5 (1991)
- Statistics of Primordial Density Perturbations from Discrete Seed Masses.** *Robert J. Scherrer & Edmund Bertschinger.* 381, 349, 195-B1 (1991)
- A Photoionization Model for the Optical Line Emission from Cooling Flows.** *Megan Donahue & G. Mark Voit.* 381, 361, 195-C1 (1991)
- Systematic Bias in Cluster Galaxy Data, Affecting Galaxy Distances and Evolutionary History.** *Donald H. Gudehus.* 382, 1, 200-A13 (1991)
- Large-Scale Peculiar Velocity Fields in Superclusters of Galaxies.** *G. Gavazzi, M. Scoggio, A. Boselli, & G. Trinchieri.* 382, 19, 200-C5 (1991)
- The Galaxy Two-Point Correlation Function Down to  $V = 26$  Magnitudes on  $0^\circ$  5 Scales.** *Lyman W. Neuschafer, Rogier A. Windhorst, & Alan Dressler.* 382, 32, 200-D12 (1991)
- Void Statistics of the CfA Redshift Survey.** *Michael S. Vogeley, Margaret J. Geller, & John P. Huchra.* 382, 44, 200-E12 (1991)
- An Analysis of Abell and ACO Catalogs of Clusters of Galaxies.** *Mariano A. Nicora & Diego G. Lambas.* 382, 55, 200-F11 (1991)
- Anisotropies of the Cosmic Background Radiation in a "Hot" Dark Matter Universe.** *Peter Anninos, Richard A. Matzner, Robin Tuluie, & Joan Centrella.* 382, 71, 201-A1 (1991)
- Upper Limit on Interstellar Gas in Coma Cluster Ellipticals.** *Claude R. Canizares & Paula Blizzard.* 382, 79, 201-B1 (1991)
- Scale-invariant Clustering in the Large-Scale Distribution of Galaxies.** *Luigi Guzzo, Angela Iovino, Guido Chincarini, Riccardo Giovanelli, & Martha P. Haynes.* 382, L5, 205-B1 (1991)

- Neutral Hydrogen Observations of Galaxies in Superclusters.** *M. P. Haynes & R. Giovanelli.* 77, 331, 49-B1 (1991)
- A Compilation of Redshifts and Velocity Dispersions for Abell Clusters (Epoch 1991.2).** *Mitchell F. Struble & Herbert J. Rood.* 77, 363, 49-F1 (1991)
- Precollapse Scale Invariance in Gravitational Instability.** *F. Moutarde, J.-M. Alimi, F. R. Bouchet, R. Pellar, & A. Ramani.* 382, 377, 206-CS (1991)
- Infrared Images, Virgo Spirals, and the Tully-Fisher Law.** *R. F. Peletier & S. P. Willner.* 382, 382, 206-C13 (1991)
- Constraints on Cosmological Models from the IRAS QDOT Survey Results.** *Changbom Park.* 382, L59, 211-B1 (1991)
- A Hydrodynamic Approach to Cosmology: Texture-seeded Cold Dark Matter and Hot Dark Matter Cosmogonies.** *R. Y. Cen, J. P. Ostriker, D. N. Spergel, & N. Turok.* 383, 1, 212-B1 (1991)
- Nonlinear Matter Clustering Properties of a Cold Dark Matter Universe.** *François R. Bouchet, Richard Schaeffer, & Marc Davis.* 383, 19, 212-C7 (1991)
- Deep Galactic Surveys and the Structure of the Universe.** *Olga E. Buryak, Marek Demianski, & Andrej G. Doroshkevich.* 383, 41, 212-E1 (1991)
- Models of Voids in Elliptic Universes.** *A. Chamorro.* 383, 51, 212-F1 (1991)
- Thin and Giant Luminous Arcs: A Strong Test of the Lensing Cluster Mass Distribution.** *F. Hammer.* 383, 66, 212-G8 (1991)
- Bound Populations around cD Galaxies and cD Velocity Offsets in Clusters of Galaxies.** *Karl Gebhardt & Timothy C. Beers.* 383, 72, 213-A1 (1991)
- The Three-Point Correlation Function for Abell Clusters: Observations and Simulations.** *J. Richard Gott III, Bin Gao, & Changbom Park.* 383, 90, 213-B10 (1991)
- Expectations for X-Ray Cluster Observations by the ROSAT Satellite.** *A. E. Evrard & J. P. Henry.* 383, 95, 213-C1 (1991)
- Evolution of Clusters of Galaxies.** *N. Kaiser.* 383, 104, 213-C11 (1991)
- Microwave Background Anisotropies Implied by Large-Scale Galaxy Correlations: The Minimum of  $C(0)$  and Cosmological Parameters.** *A. Kashlinsky.* 383, L1, 219-A7 (1991)
- The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. I. Southern Clusters.** *J. R. Mould, L. Staveley-Smith, R. A. Schommer, G. D. Bothun, P. J. Hall, Ming Sheng Han, J. P. Huchra, J. Roth, W. Walsh, & A. E. Wright.* 383, 467, 220-B7 (1991)
- Optical Colors of Early-Type Galaxies in Compact Groups.** *Stephen E. Zepf, Bradley C. Whitmore, & Harold F. Levison.* 383, 524, 220-G1 (1991)
- Modeling the Evolution of Galaxies in Compact Groups.** *Stephen E. Zepf & Bradley C. Whitmore.* 383, 542, 221-A8 (1991)
- Phase Shifts in Gravitationally Evolving Density Fields.** *Barbara S. Ryden & Mirt Gramann.* 383, L33, 226-B1 (1991)
- GALAXIES: DISTANCES**
- New Velocity Dispersions and Photometry for E and S0 Galaxies in the Great Attractor.** *Alan Dressler, S. M. Faber, & David Burstein.* 368, 54, 23-G1 (1991)
- Zero Point of the Supernova Hubble Diagram.** *M. Fukugita & C. J. Hogan.* 368, L11, 28-C1 (1991)
- New Cepheid Distances to Nearby Galaxies Based on BVRI CCD Photometry. II. The Local Group Galaxy M33.** *Wendy L. Freedman, Christine D. Wilson, & Barry F. Madore.* 372, 455, 81-D9 (1991)
- Surface Brightness Fluctuations: A Bridge from M31 to the Hubble Constant.** *John L. Tonry.* 373, L1, 91-A8 (1991)
- Single and Binary Star Evolution.** *Icko Iben, Jr.* 76, 55, 24-G3 (1991)
- The Distance to the Coma Cluster Using the B-Band Tully-Fisher Relation.** *M. Fukugita, S. Okamura, K. Tarusawa, H. J. Rood, & B. A. Williams.* 376, 8, 125-B9 (1991)
- Gravitational Lensing, Time Delay, and Angular Diameter Distance.** *Ramesh Narayan.* 378, L5, 157-B1 (1991)
- Properties of the SN 1987A Circumstellar Ring and the Distance to the Large Magellanic Cloud.** *N. Panagia, R. Gilmozzi, F. Macchetto, H.-M. Adorf, & R. P. Kirshner.* 380, L23, 181-D1 (1991)
- Systematic Bias in Cluster Galaxy Data, Affecting Galaxy Distances and Evolutionary History.** *Donald H. Gudehus.* 382, 1, 200-A13 (1991)
- Infrared Images, Virgo Spirals, and the Tully-Fisher Law.** *R. F. Peletier & S. P. Willner.* 382, 382, 206-C13 (1991)
- Planetary Nebulae as Standard Candles. VII. A Test versus Hubble Type in the NGC 1023 Group.** *Robin Ciardullo, George H. Jacoby, & William E. Harris.* 383, 487, 220-D1 (1991)
- GALAXIES: EVOLUTION**
- Stellar Population Synthesis Revisited.** *Stéphane Charlot & Gustavo Bruzual.* 367, 126, 13-E5 (1991)
- The Number Counts and Infrared Backgrounds from Infrared-bright Galaxies.** *P. B. Hacking & B. T. Soifer.* 367, L49, 22-B7 (1991)
- Chemical Evolution with Bursts of Star Formation: Element Ratios in Dwarf Galaxies.** *Gerard Gilmore & Rosemary F. G. Wyse.* 367, L55, 22-C1 (1991)
- Hydrodynamic Constraints on the Radial Structure of Late-Type Galaxy Disks.** *Curtis Struck-Marcell.* 368, 348, 29-D5 (1991)
- BL Lacertae Objects and Radio-loud Quasars within an Evolutionary Unified Scheme.** *F. Vagnetti, E. Giallongo, & A. Cavaliere.* 368, 366, 29-E11 (1991)
- A Deep Imaging and Spectroscopic Survey of Faint Galaxies.** *S. J. Lilly, L. L. Cowie, & J. P. Gardner.* 369, 79, 37-A1 (1991)
- Relics of an Eruptive Starburst in NGC 1569.** *William H. Waller.* 370, 144, 48-G12 (1991)
- Fueling Starburst Galaxies with Gas-rich Mergers.** *Joshua E. Barnes & Lars E. Hernquist.* 370, L65, 59-B7 (1991)
- High Chemical Abundances in Virgo Spiral Galaxies?** *Gregory A. Shields, Evan D. Skillman, & Robert C. Kennicutt, Jr.* 371, 82, 61-B1 (1991)
- Discovery of a Normal Galaxy at  $z = 1.018$ .** *D. J. Thompson & S. Djorgovski.* 371, L55, 73-B6 (1991)
- Faint Galaxies: Bounds on the Epoch of Galaxy Formation and the Cosmological Deceleration Parameter.** *Yuzuru Yoshii & Bruce A. Peterson.* 372, 8, 74-B6 (1991)
- H I Deficiency in Cluster Spiral Galaxies: Dependence on Galaxy Size.** *Monica Valluri & Chanda J. Jog.* 374, 103, 99-C7 (1991)
- Evolution of High-Redshift Lyman-Limit Absorption Systems.** *Kenneth M. Lanzetta.* 375, 1, 111-A11 (1991)
- Dynamical Segregation of Direct and Retrograde Orbits in Binary Disk Galaxies.** *William C. Keel.* 375, L5, 117-A13 (1991)
- The Properties of NGC 2777: Are Companion Galaxies Young?** *Halton Arp & Jack W. Sulentic.* 375, 569, 119-G1 (1991)
- Winds, Outflows, and Inflows in X-Ray Elliptical Galaxies. I.** *Luca Ciotti, Annibale D'Ercole, Silvia Pellegrini, & Alvio Renzini.* 376, 380, 131-B12 (1991)
- Inhomogeneous Halo Collapse and Early Galactic Chemical Evolution: Globular Cluster Metallicities.** *G. Malinie, D. H. Hartmann, & G. J. Mathews.* 376, 520, 132-G9 (1991)
- The Origin of the Quasi-stellar Object Absorption Lines.** *S. M. Viegas & R. B. Gruenwald.* 377, 39, 138-E5 (1991)
- Narrow-Band Photometry and the Evolution of Galaxies. III. The Intermediate-Redshift Sample.** *Karl D. Rakos, James M. Schombert, & Tobias J. Kreidl.* 377, 382, 144-E7 (1991)
- Attenuation of Lyman-Alpha Emission by Dust in Damped Lyman-Alpha Systems.** *Stéphane Charlot & S. Michael Fall.* 378, 471, 158-C7 (1991)
- A New Spectroscopic Survey for Damped Ly $\alpha$  Absorption Lines from High-Redshift Galaxies.** *Kenneth M. Lanzetta, Arthur M. Wolfe, David A. Turnshek, Limin Lu, Richard G. McMahon, & Cyril Hazard.* 77, 1, 43-B1 (1991)
- NGC 4286 and NGC 3377A: Galaxies with Mixed Morphologies between the Dwarf Im and dE/dSO Types.** *Allan Sandage & G. Lyle Hoffman.* 379, L45, 175-A11 (1991)
- The Discovery of a Young Radio Galaxy at  $z = 2.390$ : Probing Initial Star Formation at  $z \lesssim 3.0$ .** *Roger A. Windhorst, David Burstein, Doug F. Mathis, Lynn W. Neuschafer, F. Bertola, L. M. Buson, David C. Koo, Keith Matthews, Peter D. Barthel, & K. C. Chambers.* 380, 362, 182-G1 (1991)
- Discovery of a Low-Redshift Ultraluminous "E+A" Galaxy.** *William R. Oegerle, John M. Hill, & John G. Hoessel.* 381, L9, 194-B7 (1991)
- Systematic Bias in Cluster Galaxy Data, Affecting Galaxy Distances and Evolutionary History.** *Donald H. Gudehus.* 382, 1, 200-A13 (1991)

- A Radio-quiet Galaxy at Redshift  $z = 3.409$ . D. A. Turnshek, F. Macchetto, M. V. Bencke, C. Hazard, W. B. Sparks, & R. G. McMahon. 382, 26, 200-D1 (1991)
- The Galaxy Two-Point Correlation Function Down to  $V = 26$  Magnitudes on 0.5 Scales. Lyman W. Neuschafer, Rogier A. Windhorst, & Alan Dressler. 382, 32, 200-D12 (1991)
- Effects of Internal Absorption on Galaxy Number Count and Redshift Distribution. Boqi Wang. 383, L37, 226-B6 (1991)
- GALAXIES: FORMATION**
- Modeling Galaxy Formation in Evolving Dark Matter Halos. Shaun Cole. 367, 45, 12-E7 (1991)
- Dissipationless Collapse in an Expanding Universe. Neal Katz. 368, 325, 29-B4 (1991)
- A Deep Imaging and Spectroscopic Survey of Faint Galaxies. S. J. Lilly, L. L. Cowie, & J. P. Gardner. 369, 79, 37-A1 (1991)
- Filamentary Superclustering in a Universe Dominated by Cold Dark Matter. Michael J. West, Jens K. Villumsen, & Avishai Dekel. 369, 287, 41-C7 (1991)
- Redshift-Space Correlation Functions in the Cold Dark Matter Scenario. Yasushi Suto & Tatsushi Sugiyohara. 370, L15, 53-C7 (1991)
- Fueling Starburst Galaxies with Gas-rich Mergers. Joshua E. Barnes & Lars E. Hernquist. 370, L65, 59-B7 (1991)
- Statistics of Peaks in Cosmological Nonlinear Density Fields. Tatsushi Sugiyohara & Yasushi Suto. 371, 470, 67-D1 (1991)
- Bosons: Hot Dark Matter with Small-Scale Power. Jes Madsen. 371, 17, 73-A11 (1991)
- Discovery of a Normal Galaxy at  $z = 1.018$ . D. J. Thompson & S. Djorgovski. 371, L55, 73-B6 (1991)
- The Formation of Galaxies and Quasars in a Texture-seeded Cold Dark Matter Cosmogony. Andrew K. Gooding, David N. Spergel, & Neil Turok. 372, L5, 79-A13 (1991)
- Type Ia Supernovae: Constraints on Baryonic Dark Matter. Tammy A. Smecker & Rosemary F. G. Wyse. 372, 448, 81-D1 (1991)
- Perturbations of the Robertson-Walker Space: Multicomponent Sources and Generalized Gravity. Jai-chan Hwang. 375, 443, 118-C7 (1991)
- What Determines the Physical Quantities of Galaxies? A Two-Component Gas Model for Protogalaxies with Energy Input from Supernovae. Satoru Ikeuchi & Colin A. Norman. 375, 479, 118-F9 (1991)
- Global Stability of Self-similar Newtonian Gaseous Disks against Axisymmetric Perturbations. José P. S. Lemos, Agnieszka Kalnajs, & Donald Lynden-Bell. 375, 484, 118-G1 (1991)
- Gravitational Clustering of Gaussian Density Fluctuations and the Origin of Hierarchy Correlations. A. Kashlinsky. 376, L5, 130-B1 (1991)
- Formation of Galactic Halos from Seeded Hot Dark Matter. Anthony van Dalen & Jens Verner Villumsen. 376, 371, 131-B1 (1991)
- The Fragmentation of "Pancakes" in a Dark Matter-dominated Universe. Wenbo Yuan, Joan M. Centrella, & Michael L. Norman. 376, L29, 137-A11 (1991)
- Dissipational Galaxy Formation. I. Effects of Gasdynamics. Neal Katz & James E. Gunn. 377, 365, 144-D1 (1991)
- A Search for Redshifted Neutral Hydrogen from Protoclusters of Galaxies. Juan M. Uson, Durgadas S. Bagri, & Timothy J. Cornwell. 377, L65, 150-B1 (1991)
- Discovery of a Ly $\alpha$  Galaxy near a Damped Ly $\alpha$  Absorber at  $z = 2.3$ . James D. Lowenthal, Craig J. Hogan, Richard F. Green, Adeline Caulet, Bruce E. Woodgate, Larry Brown, & Craig B. Foltz. 377, L73, 150-C1 (1991)
- Abundance Gradients and Galaxy Formation. M. Stiavelli & F. Matteucci. 377, L79, 150-C9 (1991)
- Fluctuations of the Microwave Background Radiation on Large and Intermediate Angular Scales. F. Atrio-Barandela, A. G. Doroshkevich, & A. A. Klypin. 378, 1, 151-A11 (1991)
- Attenuation of Lyman-Alpha Emission by Dust in Damped Lyman-Alpha Systems. Stéphane Charlot & S. Michael Fall. 378, 471, 158-C7 (1991)
- Cosmological Velocity-Density Relation in the Quasi-linear Regime. Adi Nusser, Avishai Dekel, Edmund Bertschinger, & George R. Blumenthal. 379, 6, 163-B7 (1991)
- Superclustering at High Redshifts. Michael J. West. 379, 19, 163-C7 (1991)
- Galaxy Formation through Hierarchical Clustering. Simon D. M. White & Carlos S. Frenk. 379, 52, 163-F3 (1991)
- A New Spectroscopic Survey for Damped Ly $\alpha$  Absorption Lines from High-Redshift Galaxies. Kenneth M. Lanzetta, Arthur M. Wolfe, David A. Turnshek, Limin Lu, Richard G. McMahon, & Cyril Hazard. 377, 1, 43-B1 (1991)
- Baryon Isocurvature Scenario in Inflationary Cosmology: A Particle Physics Model and Its Astrophysical Implications. Jun'ichi Yokoyama & Yasushi Suto. 379, 427, 170-B1 (1991)
- Collapse of Population III Objects Induced by Cold Collisionless Dark Matter. J. C. N. de Araujo & R. Opher. 379, 461, 170-D10 (1991)
- Large-Scale Evolution of a Perturbed Universe. Jai-chan Hwang. 380, 307, 182-B6 (1991)
- The Scale Dependence of Galaxy Distribution Functions. William C. Saslaw & Philippe Crane. 380, 315, 182-C1 (1991)
- Dynamics of Cooling Gas in Galactic Dark Halos. Julio F. Navarro & Willy Benz. 380, 320, 182-C7 (1991)
- The Clustering of Faint Galaxies. G. Efstathiou, G. Bernstein, N. Katz, J. A. Tyson, & P. Guhathakurta. 380, L47, 188-B1 (1991)
- Tidally Triggered Galaxy Formation. I. Evolution of the Galaxy Luminosity Function. Cedric Lacey & Joseph Silk. 381, 14, 189-C1 (1991)
- Spectroscopy of Spatially Extended Material around High-Redshift Radio-loud Quasars. Timothy M. Heckman, Matthew D. Lehner, George K. Miley, & Wil van Breugel. 381, 373, 195-D1 (1991)
- Near-Infrared Observations of the  $z \sim 2.3$  IRAS Source FSC 10214+4724. B. T. Soifer, G. Neugebauer, J. R. Graham, K. Matthews, J. M. Mazzarella, C. J. Lonsdale, M. Rowan-Robinson, T. Broadhurst, A. Lawrence, & R. McMahon. 381, L55, 199-D1 (1991)
- A Radio-quiet Galaxy at Redshift  $z = 3.409$ . D. A. Turnshek, F. Macchetto, M. V. Bencke, C. Hazard, W. B. Sparks, & R. G. McMahon. 382, 26, 200-D1 (1991)
- Gauge-invariant Joining Conditions for Cosmological Perturbations. Jai-chan Hwang & Ethan T. Vishniac. 382, 363, 206-B1 (1991)
- Precollapse Scale Invariance in Gravitational Instability. F. Moutarde, J.-M. Alimi, F. R. Bouchet, R. Pellat, & A. Ramani. 382, 377, 206-C5 (1991)
- A Hydrodynamic Approach to Cosmology: Texture-seeded Cold Dark Matter and Hot Dark Matter Cosmogonies. R. Y. Cen, J. P. Ostriker, D. N. Spergel, & N. Turok. 383, 1, 212-B1 (1991)
- The Ordered Nature of Elliptical Galaxies: Implications for Their Intrinsic Angular Momenta and Shapes. Marijn Franx, Garth Illingworth, & Tim de Zeeuw. 383, 112, 213-D7 (1991)
- Microwave Background Anisotropies Implied by Large-Scale Galaxy Correlations: The Minimum of  $C(0)$  and Cosmological Parameters. A. Kashlinsky. 383, L1, 219-A7 (1991)
- GALAXIES: GENERAL**
- Statistical-Mechanical Selection of the Shapes of Disk Galaxies. David Montgomery & Y. C. Lee. 368, 380, 29-G1 (1991)
- First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0303. P. Crane, R. Albrecht, C. Barbieri, J. C. Blades, A. Bokensberg, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kamperman, I. R. King, F. Macchetto, C. D. Mackay, F. Paresce, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, & W. B. Sparks. 369, L59, 46-A7 (1991)
- What COBE Might See: The Far-Infrared Cosmological Background. C. A. Beichman & G. Helou. 370, L1, 53-B1 (1991)
- Voids in a Neutrino-dominated Universe. Ning Zeng & Simon D. M. White. 374, 1, 98-B1 (1991)
- High Angular Resolution Broad-Band Imaging in the Mid-Infrared: The Infrared-bright Galaxy NGC 34. Eric Keto, Garrett Jernigan, Roger Ball, John Arens, & Margaret Meixner. 374, L29, 110-B1 (1991)
- The Case Low-Dispersion Northern Sky Survey. XII. A Region in Southern Canes Venatici. Peter Pesch, N. Sanduleak, & C. B. Stephenson. 76, 1043, 40-B1 (1991)
- Surface Photometry of a Sample of Elliptical and S0 Galaxies. R. R. de Carvalho, S. Djorgovski, & L. N. da Costa. 76, 1067, 40-E1 (1991)

**GALAXIES: INDIVIDUAL****Messier Number: M31**

- Extragalactic Globular Clusters. II. The M31 Globular Cluster System. *John P. Huchra, Jean P. Brodie, & Stephen M. Kent.* 370, 495, 54-E5 (1991)
- The Distribution and Kinematics of Neutral Gas in M31. *Robert Braun.* 372, 54, 74-F6 (1991)
- Massive Black Holes in the Nuclei of Spiral Galaxies: M31 and the Problem of the Initial Conditions. *M. Bradley, A. Curir, & F. de Felice.* 381, 72, 189-G11 (1991)
- The Discrete X-Ray Source Population in M31. *G. Trinchieri & G. Fabbiano.* 382, 82, 201-B6 (1991)

**Messier Number: M33**

- OB Star Formation and H I Production in Molecular Clouds in M33. *Christine D. Wilson & Nick Scoville.* 370, 184, 49-D11 (1991)
- New Cepheid Distances to Nearby Galaxies Based on BVRI CCD Photometry. II. The Local Group Galaxy M33. *Wendy L. Freedman, Christine D. Wilson, & Barry F. Madore.* 372, 455, 81-D9 (1991)
- Galactic Disk Warps. *Konrad Kuijken.* 376, 467, 132-C4 (1991)

**Messier Number: M82**

- H II Regions in M82: High-Resolution Millimeter Continuum Observations. *J. E. Carlstrom & Philipp P. Kronberg.* 366, 422, 8-B1 (1991)
- Infrared Mapping of M82: A Starburst in an Edge-on Barred Galaxy. *C. M. Telesco, H. Campins, M. Joy, K. Dietz, & R. Decher.* 369, 135, 37-E11 (1991)
- A Nonthermal Radio Halo Surrounding M82. *E. R. Seaquist & Nils Odegard.* 369, 320, 41-F13 (1991)
- CO (3-2) Mapping and Gas Excitation in the Core of M82. *R. P. J. Tilanus, L. J. Tacconi, E. C. Sutton, S. Zhou, D. B. Sanders, C. G. Wynn-Williams, K. Y. Lo, & S. A. Stephens.* 376, 500, 132-E13 (1991)

- First Observations of the CO  $J = 6-5$  Transition in Starburst Galaxies. *A. I. Harris, R. E. Hills, J. Stutzki, U. U. Graf, A. P. G. Russell, & R. Genzel.* 382, L75, 211-C7 (1991)

- Near-Infrared [Fe II] Emission of M82 Supernova Remnants: Implications for Tracing the Supernova Content of Galaxies. *Matthew A. Greenhouse, Charles E. Woodward, Harley A. Thronson, Jr., Richard J. Rudy, George S. Rossano, Peter Erwin, & R. C. Puerter.* 383, 164, 214-B1 (1991)

**Messier Number: M83**

- Orbit Crowding of Molecular Gas at a Bar-Spiral Arm Transition Zone in M83. *Jeffrey D. P. Kenney & Steven D. Lord.* 381, 118, 190-D13 (1991)
- A Molecular Gas Ridge Offset from the Dust Lane in a Spiral Arm of M83. *Steven D. Lord & Jeffrey D. P. Kenney.* 381, 130, 190-E13 (1991)

**Messier Number: M86**

- Ram-Pressure Stripping of the Multiphase Interstellar Medium of the Virgo Cluster Elliptical Galaxy M86 (NGC 4406). *David A. White, A. C. Fabian, W. Forman, C. Jones, & C. Stern.* 375, 35, 111-D9 (1991)

**Messier Number: M94**

- The Far-Infrared Morphology of the Double-ringed Galaxy NGC 4736 (M94): A Ring Surrounding an Extended Nucleus. *Beverly J. Smith, D. F. Lester, P. M. Harvey, & R. W. Pogge.* 373, 66, 86-G5 (1991)

**Messier Number: M101**

- The Star-forming Disk and CO Bar in M101. *Jeffrey D. P. Kenney, Nick Z. Scoville, & Christine D. Wilson.* 366, 432, 8-C1 (1991)

**Messier Number: NGC 34**

- High Angular Resolution Broad-Band Imaging in the Mid-Infrared: The Infrared-bright Galaxy NGC 34. *Eric Keto, Garrett Jernigan, Roger Ball, John Arens, & Margaret Meixner.* 374, L29, 110-B1 (1991)

**NGC Number: NGC 205**

- Continuum Emission at 1 Millimeter from the Elliptical Galaxy NGC 205. *Michel Fich & Paul Hodge.* 374, L17, 103-D7 (1991)

**NGC Number: NGC 253**

- Multicolor CCD Imaging of Supergiants in the Disk of NGC 253. *T. J. Davidge, O. Le Feuvre, & C. C. Clark.* 370, 559, 55-D7 (1991)

- Molecular Gas Excitation in NGC 253. *W. F. Wall, D. T. Jaffe, F. P. Israel, & F. N. Bash.* 380, 384, 183-A11 (1991)

- Infrared Hot Spots in the Nucleus of NGC 253. *Duncan A. Forbes, Martin J. Ward, & D. L. DePoy.* 380, L63, 188-C6 (1991)

- First Observations of the CO  $J = 6-5$  Transition in Starburst Galaxies. *A. I. Harris, R. E. Hills, J. Stutzki, U. U. Graf, A. P. G. Russell, & R. Genzel.* 382, L75, 211-C7 (1991)

**NGC Number: NGC 520**

- Dynamical Simulations of the Interacting Galaxies in the NGC 520/UGC 957 System. *S. A. Stanford & Marc Balcells.* 370, 118, 48-E5 (1991)

- Recent Star Formation in the Interacting Galaxy System NGC 520. *S. A. Stanford.* 381, 409, 195-G1 (1991)

**NGC Number: NGC 891**

- Extrapolanar Ionized Gas and Kinematics in the Edge-on Galaxy NGC 891. *Jean W. Keppel, Ralf-Jürgen Dettmar, John S. Gallagher III, & Morton S. Roberts.* 374, 507, 105-D6 (1991)

- Polarized Radio Emission from the Edge-on Spiral Galaxies NGC 891 and NGC 4565. *S. Sukumar & R. J. Allen.* 382, 100, 201-D1 (1991)

- Planetary Nebulae as Standard Candles. VII. A Test versus Hubble Type in the NGC 1023 Group. *Robin Ciardullo, George H. Jacoby, & William E. Harris.* 383, 487, 220-D1 (1991)

**NGC Number: NGC 985**

- Modeling an Accretion Disk in NGC 985. *R. M. Stanga, J. M. Rodriguez Espinosa, & F. Mannucci.* 379, 592, 172-A9 (1991)

**NGC Number: NGC 1023**

- Planetary Nebulae as Standard Candles. VII. A Test versus Hubble Type in the NGC 1023 Group. *Robin Ciardullo, George H. Jacoby, & William E. Harris.* 383, 487, 220-D1 (1991)

**NGC Number: NGC 1068**

- High-Resolution Aperture Synthesis of Molecular Gas in NGC 1068. *P. Planesas, N. Scoville, & S. T. Myers.* 369, 364, 42-C9 (1991)

- HST Imaging of the Inner 3 Arcseconds of NGC 1068 in the Light of [O III]  $\lambda\lambda$  5007. *I. N. Evans, H. C. Ford, A. L. Kinney, R. R. J. Antonucci, L. Armus, & S. Caganoff.* 369, L27, 45-C9 (1991)

- NGC 1068: Resolution of Nuclear Structure in the Optical Continuum.

- Roger Lynds, S. M. Faber, Edward J. Groth, Jon A. Holtzman, Robert M. Light, Earl J. O'Neil, Jr., William A. Baum, Douglas G. Currie, S. P. Ewald, J. Jeff Hester, Jerome A. Kristian, P. Kenneth Seidelmann, Edward J. Shaya, & James A. Westphal.* 369, L31, 45-D1 (1991)

- High-Resolution Imaging of Brackett- $\gamma$  and H<sub>2</sub> 1-0 S(1) Emission in the Seyfert Galaxy NGC 1068. *V. Rotaciuc, A. Krabbe, M. Cameron, S. Drapatz, R. Genzel, A. Sternberg, & J. W. V. Storey.* 370, L23, 53-D6 (1991)

- Near-Infrared Long-Slit Spectra of NGC 1068. *M. Tamura, S. G. Kleinmann, N. Z. Scoville, & R. R. Joyce.* 371, 131, 61-F3 (1991)

- Imaging Spectrophotometry of Ionized Gas in NGC 1068. II. Global Ionization of the Inner Disk. *Jonathan Bland-Hawthorn, James Sokolowski, & Gerald Cecil.* 375, 78, 112-A1 (1991)

- Imaging Spectrophotometry of Ionized Gas in NGC 1068. III. Anisotropic Excitation of the Large-Scale Disk by Scattering of Nuclear Continuum. *James Sokolowski, Jonathan Bland-Hawthorn, & Gerald Cecil.* 375, 583, 120-A1 (1991)

- Faint Object Spectrograph Spectroscopy of Resolved Structure in the Nucleus of NGC 1068. *S. Caganoff, R. R. J. Antonucci, H. C. Ford, G. A. Kriss, G. Hartig, L. Armus, I. N. Evans, E. Rosenblatt, R. C. Bohlin, & A. L. Kinney.* 377, L9, 143-B11 (1991)

- Multidirectional Views of the Active Nucleus of NGC 1068. *J. S. Miller, R. W. Goodrich, & William G. Mathews.* 378, 47, 151-E13 (1991)

- IUE Observations of NGC 1068: The Extremely Luminous Starburst Knots. *F. C. Bruhweiler, K. Q. Truong, & B. Altnier.* 379, 596, 172-B1 (1991)

- IUE Observations of NGC 1068: The Extended High-Ionization Emission Region. *K. Q. Truong & F. C. Bruhweiler.* 379, 609, 172-C1 (1991)

**NGC Number: NGC 1386**

Kinematics and Ionization of Extended Gas in Active Galaxies. VI. The Seyfert 2 Galaxy NGC 1386. *K. A. Weaver, A. S. Wilson, & J. A. Baldwin.* 366, 50, 1-F5 (1991)

**NGC Number: NGC 1399**

Constraints on the Origin of the Ultraviolet Upturn in Elliptical Galaxies from Hopkins Ultraviolet Telescope Observations of NGC 1399. *Henry C. Ferguson, Arthur F. Davidsen, Gerard A. Kriss, William P. Blair, Charles W. Bowers, W. Van Dyke Dixon, Samuel T. Durrance, Paul D. Feldman, Richard C. Henry, Jeffrey W. Kruk, H. Warren Moos, Olaf Vancura, Knox S. Long, & Randy A. Kimble.* 382, L69, 211-C1 (1991)

**NGC Number: NGC 1566**

Faint Object Spectrograph Observations of the Low-Luminosity Seyfert Galaxy NGC 1566. *G. A. Kriss, G. F. Hartig, L. Armus, William P. Blair, S. Caganoff, & L. Dressel.* 377, L13, 143-C1 (1991)

**NGC Number: NGC 1569**

Relics of an Eruptive Starburst in NGC 1569. *William H. Waller.* 370, 144, 48-G12 (1991)

**NGC Number: NGC 2110**

High-Excitation Extranuclear Gas in Seyfert Galaxies. *Christopher A. Haniff, Martin J. Ward, & Andrew S. Wilson.* 368, 167, 25-B5 (1991)

**NGC Number: NGC 2366**

Superbubble Blowout in the Giant H II Region NGC 2363? *Jean-René Roy, J. Boulesteix, Gilles Joncas, & B. Grundseth.* 367, 141, 13-F8 (1991)

**NGC Number: NGC 2775**

The Properties of NGC 2777: Are Companion Galaxies Young? *Halton Arp & Jack W. Sulentic.* 375, 569, 119-G1 (1991)

**NGC Number: NGC 2777**

The Properties of NGC 2777: Are Companion Galaxies Young? *Halton Arp & Jack W. Sulentic.* 375, 569, 119-G1 (1991)

**NGC Number: NGC 2782**

The Discovery of a Long H I Plume near the Peculiar Galaxy NGC 2782 (Arp 215). *Beverly J. Smith.* 378, 39, 151-E1 (1991)

**NGC Number: NGC 2841**

Galactic Disk Warps. *Konrad Kuijken.* 376, 467, 132-C4 (1991)

**NGC Number: NGC 2903**

The Interstellar Medium of the Hot-Spot Galaxy NGC 2903. *James M. Jackson, Andreas Eckart, Murray Cameron, Wolfgang Wild, Paul T. P. Ho, Richard W. Pogge, & Andrew I. Harris.* 375, 105, 112-C9 (1991)

**NGC Number: NGC 3034**

Near-Infrared [Fe II] Emission of M82 Supernova Remnants: Implications for Tracing the Supernova Content of Galaxies. *Matthew A. Greenhouse, Charles E. Woodward, Harley A. Thronson, Jr., Richard J. Rudy, George S. Rossano, Peter Erwin, & R. C. Puett.* 383, 164, 214-B1 (1991)

**NGC Number: NGC 3067**

New Observations of the Gas Cloud Associated with the Quasar-Galaxy Pair 3C 232/NGC 3067. *John T. Stocke, James Case, Megan Donahue, J. Michael Shull, & Theodore P. Snow.* 374, 72, 98-G7 (1991)

**NGC Number: NGC 3079**

The Neutral Hydrogen Distribution of NGC 3079. *Judith A. Irwin & E. R. Seaquist.* 371, 111, 61-D9 (1991)

**NGC Number: NGC 3265**

Detection of CO Emission in the Elliptical Galaxies NGC 3265 and NGC 5666. *M. A. Gordon.* 371, 563, 68-E1 (1991)

**NGC Number: NGC 3377A**

NGC 4286 and NGC 3377A: Galaxies with Mixed Morphologies between the Dwarf Im and dE/dSO Types. *Allan Sandage & G. Lyle Hoffman.* 379, L45, 175-A1 (1991)

**NGC Number: NGC 3379**

Is the Standard Elliptical NGC 3379 a Triaxial Disk Galaxy? *M. Capaccioli, M. Vietri, E. V. Held, & H. Lorenz.* 371, 535, 68-B12 (1991)

**NGC Number: NGC 3516**

EXOSAT Observations of the Seyfert 1 Galaxy NGC 3516. *K. K. Ghosh & S. Soundararajaperumal.* 383, 574, 221-D1 (1991)

**NGC Number: NGC 3623**

Far-Infrared Counterpart to the Optical and H I Plume in the Leo Triplet of Galaxies: NGC 3623, NGC 3627, and NGC 3628. *D. H. Hughes, P. N. Appleton, & J. M. Schombert.* 370, 176, 49-C11 (1991)

**NGC Number: NGC 3627**

Far-Infrared Counterpart to the Optical and H I Plume in the Leo Triplet of Galaxies: NGC 3623, NGC 3627, and NGC 3628. *D. H. Hughes, P. N. Appleton, & J. M. Schombert.* 370, 176, 49-C11 (1991)

**NGC Number: NGC 3628**

Far-Infrared Counterpart to the Optical and H I Plume in the Leo Triplet of Galaxies: NGC 3623, NGC 3627, and NGC 3628. *D. H. Hughes, P. N. Appleton, & J. M. Schombert.* 370, 176, 49-C11 (1991)

**NGC Number: NGC 4151**

High-Rate Active Galaxy Monitoring at the Wise Observatory. III. The Broad-Line Region of NGC 4151. *D. Maoz, H. Netzer, T. Mazeh, S. Beck, E. Almoznino, E. Leibowitz, N. Brosch, H. Mendelson, & A. Laor.* 367, 493, 19-E1 (1991)

C IV Line Profile Correlations in NGC 4151. *R. P. Fahey, A. G. Michalitsianos, & D. Kazanas.* 371, 136, 61-F9 (1991)

Hard X-Ray Variability of NGC 4151. *F. Perotti, P. Maggioli, E. Quadrini, A. Bazzano, P. Ubertini, L. Bassani, J. B. Stephen, A. J. Court, A. J. Dean, N. A. Dipper, & R. A. Lewis.* 373, 75, 87-A1 (1991)

The Ultraviolet Spectrum of NGC 4151 from 1978 to 1990: General Characteristics and Evolution. *M.-H. Ulrich, A. Bokserberg, G. E. Bromage, J. Clavel, A. Elvius, M. V. Penston, G. C. Perola, & M. A. J. Snijders.* 382, 483, 207-E7 (1991)

**NGC Number: NGC 4258**

Possible Deflection of a Jet by Molecular Clouds in NGC 4258. *R. L. Plante, K. Y. Lo, Jean-René Roy, Pierre Martin, & Louis Noreau.* 381, 110, 190-D4 (1991)

**NGC Number: NGC 4286**

NGC 4286 and NGC 3377A: Galaxies with Mixed Morphologies between the Dwarf Im and dE/dSO Types. *Allan Sandage & G. Lyle Hoffman.* 379, L45, 175-A1 (1991)

**NGC Number: NGC 4472**

Multicolor CCD Photometry of Globular Clusters in Two Virgo Elliptical Galaxies. *Jean Couture, William E. Harris, & J. W. B. Allwright.* 372, 97, 75-C1 (1991)

**NGC Number: NGC 4527**

Observations of Ca II Absorption along the Nearly Parallel Lines of Sight toward 3C 273 and SN 1991T. *David M. Meyer & Katherine C. Roth.* 383, L41, 226-B11 (1991)

**NGC Number: NGC 4565**

Polarized Radio Emission from the Edge-on Spiral Galaxies NGC 891 and NGC 4565. *S. Sukumar & R. J. Allen.* 382, 100, 201-D1 (1991)

**NGC Number: NGC 4639**

Premaximum Observations of the Type Ia SN 1990N. *Bruno Leibundgut, Robert P. Kirshner, Alexei V. Filippenko, Joseph C. Shields, Craig B. Foltz, Mark M. Phillips, & George Sonneborn.* 371, L23, 66-D1 (1991)

**NGC Number: NGC 4649**

Multicolor CCD Photometry of Globular Clusters in Two Virgo Elliptical Galaxies. *Jean Couture, William E. Harris, & J. W. B. Allwright.* 372, 97, 75-C1 (1991)

**NGC Number: NGC 5077**

Testing the Gravitational Field in Elliptical Galaxies: NGC 5077. *Francesco Bertola, Daniela Bettoni, John Danziger, Elaine Sadler, Linda Sparke, & Tim de Zeeuw.* 373, 369, 92-E10 (1991)

**NGC Number: NGC 5128**

An Infrared Jet in Centaurus A: A Link to the Extranuclear Activity in Distant Radio Galaxies? *Marshall Joy, P. M. Harvey, E. K. Tolstrup, K. Sellgren, P. J. McGregor, & A. R. Hyland.* 366, 82, 2-A13 (1991)

**NGC Number: NGC 5252**

High-Excitation Extranuclear Gas in Seyfert Galaxies. *Christopher A. Haniff, Martin J. Ward, & Andrew S. Wilson.* 368, 167, 25-B5 (1991)

- NGC Number: NGC 5548**
- Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. I. An 8 Month Campaign of Monitoring NGC 5548 with IUE. *J. Clavel, G. A. Reichert, D. Alloin, D. M. Crenshaw, G. Kriss, J. H. Krolik, M. A. Malkan, H. Netzer, B. M. Peterson, W. Wamsteker, A. Altamore, T. Baribaud, P. Barr, S. Beck, L. Binette, G. E. Bromage, N. Brosch, A. I. Diaz, A. V. Filippenko, K. Fricke, C. M. Gaskell, P. Giommi, I. S. Glass, P. Gondhalekar, R. L. Hackney, J. P. Halpern, D. J. Hutter, S. Jörsäter, A. L. Kinney, W. Kollatschny, A. Koratkar, K. T. Korista, A. Laor, J.-P. Lasota, E. Leibowitz, D. Maoz, P. G. Martin, T. Mazeh, E. J. A. Meurs, A. D. Nair, P. O'Brien, D. Pelat, E. Perez, G. C. Perola, R. L. Ptak, P. Rodriguez-Pascual, E. I. Rosenblatt, A. C. Sadun, M. Santos-Lleo, R. A. Shaw, P. S. Smith, G. M. Stirpe, R. Stoner, W. H. Sun, M.-H. Ulrich, E. van Groningen, & W. Zheng.* 366, 64, 1-G7 (1991)
- Echo Mapping of Broad H $\beta$  Emission in NGC 5548. *Keith Horne, William F. Welsh, & Bradley M. Peterson.* 367, L5, 17-B10 (1991)
- Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths. *B. M. Peterson, T. J. Balonick, E. S. Barker, J. Bechtold, R. Bertram, N. G. Bochkarev, M. J. Bolte, D. Bond, T. A. Boroson, M. T. Carini, T. E. Carone, J. A. Christensen, S. D. Clements, A. L. Cochran, R. D. Cohen, D. Crampton, M. Dietrich, M. Elvis, A. Ferguson, A. V. Filippenko, K. J. Fricke, C. M. Gaskell, J. P. Halpern, J. P. Hutchra, J. B. Hutchings, W. Kollatschny, A. P. Koratkar, K. T. Korista, J. H. Krolik, N. J. Lane, A. Laor, R. J. Leacock, G. M. MacAlpine, M. A. Malkan, D. Maoz, H. R. Miller, S. L. Morris, H. Netzer, C. L. M. Oliveira, J. Penfold, M. V. Penston, E. Pérez, R. W. Pogge, M. W. Richmond, W. Romanishin, E. I. Rosenblatt, L. Saddlemeyer, A. Sadun, S. R. Sawyer, J. C. Shields, A. I. Shapovalova, A. G. Smith, H. A. Smith, P. S. Smith, W.-H. Sun, U. Thiele, T. J. Turner, S. Veilleux, R. M. Wagner, R. J. Weymann, B. J. Wilkes, B. J. Wills, D. Wills, & P. F. Younger.* 368, 119, 24-E3 (1991)
- Ultraviolet Variability of NGC 5548: Dynamics of the Continuum Production Region and Geometry of the Broad-Line Region. *J. H. Krolik, Keith Horne, T. R. Kallman, M. A. Malkan, R. A. Edelson, & G. A. Kriss.* 371, 541, 68-C6 (1991)
- IUE Observations of NGC 5548, 1978–1988: The Sizes and Kinematics of the Broad-Line Region. *Anuradha P. Koratkar & C. Martin Gaskell.* 375, 85, 112-A13 (1991)
- NGC Number: NGC 5666**
- Detection of CO Emission in the Elliptical Galaxies NGC 3265 and NGC 5666. *M. A. Gordon.* 371, 563, 68-E1 (1991)
- NGC Number: NGC 5982**
- Is the Kinematically Distinct Core in NGC 5982 Necessarily the Remnant of an Accreted Companion? *Thomas S. Statler.* 382, L11, 205-B7 (1991)
- NGC Number: NGC 6240**
- Infrared Fluorescence of H<sub>2</sub> in NGC 6240: A Starburst Origin for the H<sub>2</sub> Luminosity. *Masuo Tanaka, Tetsuo Hasegawa, & Ian Gatley.* 374, 516, 105-E9 (1991)
- NGC Number: NGC 6764**
- The Molecular Interstellar Medium and the Near-Infrared Continuum of the Barred LINER NGC 6764. *A. Eckart, M. Cameron, J. M. Jackson, R. Genzel, A. I. Harris, W. Wild, & H. Zinnecker.* 372, 67, 74-G9 (1991)
- NGC Number: NGC 6822**
- Far-Infrared Properties of NGC 6822. *John S. Gallagher III, Deidre A. Hunter, Fred C. Gillett, & Walter L. Rice.* 371, 142, 61-G1 (1991)
- A COSMOS Study of the Structure and Content of NGC 6822. *Paul Hodge, Toby Smith, Paul Eskridge, Harvey MacGillivray, & Steven Beard.* 379, 621, 172-D1 (1991)
- NGC Number: NGC 6946**
- Origins of the 12–200 Micron Flux in NGC 6946: Starlight and Continuum Dust Emission from an Sc Galaxy. *G. Engargiola.* 76, 875, 36-G5 (1991)
- First Observations of the CO  $J = 6-5$  Transition in Starburst Galaxies. *A. I. Harris, R. E. Hills, J. Stutzki, U. U. Graf, A. P. G. Russell, & R. Genzel.* 382, L75, 211-C7 (1991)
- NGC Number: NGC 7236**
- The Extraordinary Radio Source 3C 442. *Neil F. Comins & Frazer N. Owen.* 382, 108, 201-E1 (1991)
- NGC Number: NGC 7237**
- The Extraordinary Radio Source 3C 442. *Neil F. Comins & Frazer N. Owen.* 382, 108, 201-E1 (1991)
- NGC Number: NGC 7252**
- A Merger Scenario for NGC 7252: A Tale of Two Tails. *Kirk D. Borne & Douglas O. Richstone.* 369, 111, 37-C11 (1991)
- NGC Number: NGC 7469**
- The Starburst Ring around the Seyfert Nucleus in NGC 7469. *A. S. Wilson, T. T. Helfer, C. A. Haniff, & M. J. Ward.* 381, 79, 190-A6 (1991)
- NGC Number: NGC 7702**
- Weakly Barred Early-Type Ringed Galaxies. IV. The Double-ringed S0<sup>+</sup> Galaxy NGC 7702. *R. Buta.* 370, 130, 48-F6 (1991)
- Name: Akn 120
- On the Size of the Broad-Line Region in Arakelian 120. *Bradley M. Peterson & C. Martin Gaskell.* 368, 152, 25-A1 (1991)
- Name: Arp 193
- CO Excitation and H<sub>2</sub> Masses of Infrared-luminous Galaxies. *Simon J. E. Radford, P. M. Solomon, & D. Downes.* 368, L15, 28-C7 (1991)
- Name: Arp 220
- CO Excitation and H<sub>2</sub> Masses of Infrared-luminous Galaxies. *Simon J. E. Radford, P. M. Solomon, & D. Downes.* 368, L15, 28-C7 (1991)
- Name: Arp 299
- Infrared Emission Regions in the Interacting Galaxy System Arp 299. *C. G. Wynn-Williams, S. A. Eales, E. E. Becklin, K.-W. Hodapp, R. D. Joseph, I. S. McLean, D. A. Simons, & G. S. Wright.* 377, 426, 145-A13 (1991)
- Name: Cygnus A
- Discovery of an Infrared Nucleus in Cygnus A: An Obscured Quasar Revealed? *S. Djorgovski, N. Weir, K. Matthews, & J. R. Graham.* 372, L67, 85-C5 (1991)
- Infrared Spectroscopy of Cygnus A: Implications for the Obscured Active Nucleus. *Martin J. Ward, Philip R. Blanco, Andrew S. Wilson, & Minoru Nishida.* 382, 115, 201-E11 (1991)
- Multifrequency Radio Observations of Cygnus A: Spectral Aging in Powerful Radio Galaxies. *C. L. Carilli, R. A. Perley, J. W. Dreher, & J. P. Leahy.* 383, 554, 221-B9 (1991)
- Name: Hercules A
- Heavy, Overpressured Jets and the Radio Source Hercules A. *David L. Meier, Alberto C. Sadun, & Kevin R. Lind.* 379, 141, 164-F9 (1991)
- Name: Maffei 2
- The Molecular Structure of a Starburst:  $^{13}\text{CO}$  in the Nucleus of Maffei 2. *Robert L. Hurt & Jean L. Turner.* 377, 434, 145-B8 (1991)
- Name: Markarian 231
- CO Excitation and H<sub>2</sub> Masses of Infrared-luminous Galaxies. *Simon J. E. Radford, P. M. Solomon, & D. Downes.* 368, L15, 28-C7 (1991)
- The Appearance of a New Redshift System in Markarian 231. *Todd A. Boroson, Karie A. Meyers, Simon L. Morris, & S. E. Persson.* 370, L19, 53-D1 (1991)
- Name: Markarian 359
- The Line-emitting Regions of the Exceptional Seyfert Galaxy Markarian 359. *Sylvain Veilleux.* 368, 158, 25-A9 (1991)
- Name: Markarian 464
- X-Ray Observations of the Seyfert 1 Galaxy Markarian 464. *L. Piro, G. Matt, E. Costa, D. Dal Fiume, F. Frontera, & E. Morelli.* 380, 357, 182-F9 (1991)
- Name: Markarian 573
- High-Excitation Extranuclear Gas in Seyfert Galaxies. *Christopher A. Haniff, Martin J. Ward, & Andrew S. Wilson.* 368, 167, 25-B5 (1991)
- Alphanumeric: 1215+333
- Emission from the  $z = 2$  Damped Ly $\alpha$  Absorber toward Q1215+333. *Richard Elston, Jill Bechtold, James Lowenthal, & Marcia Rieke.* 373, L39, 97-B1 (1991)

**Alphanumeric: 3C 66B**

*HST* Observations of 3C 66B: A Double-stranded Optical Jet. *F. Macchetto, R. Albrecht, C. Barbieri, J. C. Blades, A. Boksenberg, P. Crane, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kamperman, I. R. King, C. D. Mackay, F. Paresce, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, W. B. Sparks, & G. K. Miley.* 373, L55, 97-C10 (1991)

**Alphanumeric: 3C 120**

Coordinated X-Ray, Ultraviolet, and Optical Observations of 3C 120. *L. Maraschi, L. Chiappetti, R. Falomo, B. Garilli, M. Malkan, G. Tagliaferri, E. G. Tanzi, & A. Treves.* 368, 138, 24-F9 (1991)

**Alphanumeric: 3C 265**

Detection of Polarized Ultraviolet Emission from the High-Redshift Radio Galaxy 3C 265. *Buell T. Jannuzi & Richard Elston.* 366, L69, 11-C5 (1991)

**Alphanumeric: 3C 273**

Observations of Ca II Absorption along the Nearly Parallel Lines of Sight toward 3C 273 and SN 1991T. *David M. Meyer & Katherine C. Roth.* 383, L41, 226-B11 (1991)

**Alphanumeric: 3C 390.3**

Unique Broad-Line Profile Variations in the Radio Galaxy 3C 390.3. *Sylvain Veilleux & Wei Zheng.* 377, 89, 139-B7 (1991)

3C 390.3: Modeling Variable Profile Humps. *Wei Zheng, Sylvain Veilleux, & Steven A. Grandi.* 381, 418, 196-A1 (1991)

**Alphanumeric: IC 10**

Giant Molecular Clouds and the CO-to-H<sub>2</sub> Conversion Factor in IC 10. *Christine D. Wilson & I.Neill Reid.* 366, L11, 6-B7 (1991)

**Alphanumeric: IC 342**

Star Formation and the Molecular Content of IC 342. *Leslie J. Sage & P. M. Solomon.* 380, 392, 183-B7 (1991)

First Observations of the CO  $J = 6 - 5$  Transition in Starburst Galaxies. *A. I. Harris, R. E. Hills, J. Stutzki, U. U. Graf, A. P. G. Russell, & R. Genzel.* 382, L75, 211-C7 (1991)

**Alphanumeric: IC 1613**

A Cosmos Study of IC 1613. *Paul W. Hodge, Toby R. Smith, Paul B. Eskridge, Harvey T. MacGillivray, & Steven M. Beard.* 369, 372, 42-D5 (1991)

**Alphanumeric: IC 4329A**

X-Ray Observations of the Bright Seyfert Galaxy IC 4329A. *K. P. Singh, A. R. Rao, & M. N. Vahia.* 377, 417, 145-A1 (1991)

**Alphanumeric: IC 5063**

IC 5063: A Merger Remnant with a Hidden Luminous Active Nucleus. *L. Colina, W. B. Sparks, & F. Macchetto.* 370, 102, 48-C5 (1991)

**Alphanumeric: IRAS 02366-3101**

IRAS 02366-3101: An Accretion Disk Candidate among Luminous IRAS Galaxies. *Luis Colina, Sebastian Lipari, & F. Macchetto.* 382, L63, 211-B7 (1991)

**Alphanumeric: IRAS 14348-1447**

Near-Infrared Long-Slit Spectroscopy of IRAS 14348-1447. *Tadashi Nakajima, Kimiaki Kawara, Minoru Nishida, & Brooke Gregory.* 373, 452, 93-E6 (1991)

**Alphanumeric: IRAS 19254-7245**

Massive Star Formation and Superwinds in IRAS 19254-7245 (The "Superantennae"). *Luis Colina, Sebastian Lipari, & F. Macchetto.* 379, 113, 164-D5 (1991)

**Alphanumeric: IRAS 23060+0505**

Optical and Near-Infrared Polarimetry of the Infrared Luminous Galaxy IRAS 23060+0505. *J. H. Hough, C. Brindle, Beverley J. Wills, D. Wills, & J. Bailey.* 372, 478, 81-F9 (1991)

**Alphanumeric: OX 169**

OX 169: Evidence for a Recent Merger. *Alan Stockton & Tony Farnham.* 371, 525, 68-A13 (1991)

**Alphanumeric: PG 2130+099**

X-Ray Luminosity and Spectral Variability in the Seyfert Type I Galaxy: PG 2130+099. *K. P. Singh, A. R. Rao, & M. N. Vahia.* 372, 49, 74-E13 (1991)

**Alphanumeric: PKS 0521-36**

First Results from the Faint Object Camera: Observations of PKS 0521-36. *F. Macchetto, R. Albrecht, C. Barbieri, J. C. Blades, A. Boksenberg, P. Crane, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kamperman, I. R. King, C. D. Mackay, F. Paresce, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, & W. B. Sparks.* 369, L55, 46-A1 (1991)

**Alphanumeric: PKS 2155-304**

Rapid Ultraviolet Variability in the BL Lacertae Object PKS 2155-304. *R. A. Edelson, J. Saken, G. Pike, C. M. Urry, I. M. George, R. S. Warwick, H. R. Miller, M. T. Carini, & J. R. Webb.* 372, L9, 79-B5 (1991)

Short-Term X-Ray Variability of the BL Lacertae Object PKS 2155-304: Power Spectrum and Cross-Correlation Analysis. *G. Tagliaferri, L. Stella, L. Maraschi, A. Treves, & A. Celotti.* 380, 78, 177-A5 (1991)

On the Nebulosity Surrounding the BL Lacertae Object PKS 2155-304. *R. Falomo, E. Giraud, L. Maraschi, J. Melnick, E. G. Tanzi, & A. Treves.* 380, L67, 188-D1 (1991)

Optical Polarimetry of PKS 2155-304 and Constraints on Accretion Disk Models for BL Lacertae Objects. *Paul S. Smith & Michael L. Sitko.* 383, 580, 221-D9 (1991)

**Alphanumeric: PKS 2354-350**

The X-Ray Cooling Flow in the Cluster of Galaxies around PKS 2354-35. *Daniel A. Schwartz, Hale V. Bradt, Ronald A. Remillard, & I. R. Tuohy.* 376, 424, 131-F6 (1991)

**Alphanumeric: UGC 957**

Dynamical Simulations of the Interacting Galaxies in the NGC 520/UGC 957 System. *S. A. Stanford & Marc Balcells.* 370, 118, 48-E5 (1991)

**Alphanumeric: VII Zw 31**

CO Excitation and H<sub>2</sub> Masses of Infrared-luminous Galaxies. *Simon J. E. Radford, P. M. Solomon, & D. Downes.* 368, L15, 28-C7 (1991)

**GALAXIES: INTERACTIONS**

Anatomy of a Merger: CO in Arp 299 (IC 694-NGC 3690). *Anneila Sargent & Nick Scoville.* 366, L1, 6-A7 (1991)

Evidence for Environmental Effects on Early-Type Galaxy X-Ray Halos. *Raymond E. White III & Craig L. Sarazin.* 367, 476, 19-C9 (1991)

Millimeter Interferometer Observations of Infrared Luminous Galaxies: NGC 828 and NGC 6240. *Z. Wang, N. Z. Scoville, & D. B. Sanders.* 368, 112, 24-D9 (1991)

Stripped Interstellar Gas in Cluster Cooling Flows. *Noam Soker, Joel N. Bregman, & Craig L. Sarazin.* 368, 341, 29-C10 (1991)

Cluster Infall with Friction. *R. G. Carlberg & John Dubinski.* 369, 13, 36-B11 (1991)

A Merger Scenario for NGC 7252: A Tale of Two Tails. *Kirk D. Borne & Douglas O. Richstone.* 369, 111, 37-C11 (1991)

IC 5063: A Merger Remnant with a Hidden Luminous Active Nucleus. *L. Colina, W. B. Sparks, & F. Macchetto.* 370, 102, 48-C5 (1991)

Dynamical Simulations of the Interacting Galaxies in the NGC 520/UGC 957 System. *S. A. Stanford & Marc Balcells.* 370, 118, 48-E5 (1991)

Far-Infrared Counterpart to the Optical and H I Plume in the Leo Triplet of Galaxies: NGC 3623, NGC 3627, and NGC 3628. *D. H. Hughes, P. N. Appleton, & J. M. Schombert.* 370, 176, 49-C11 (1991)

Fueling Starburst Galaxies with Gas-rich Mergers. *Joshua E. Barnes & Lars E. Hernquist.* 370, L65, 59-B7 (1991)

A Near-Infrared Imaging Survey of Interacting Galaxies: The Disk-Disk Merger Candidates Subset. *S. A. Stanford & H. A. Bushouse.* 371, 92, 61-C1 (1991)

A Long-lasting Compact Group. *Fabio Governato, Rajiv Bhatia, & Guido Chincarini.* 371, L15, 66-C1 (1991)

Ultramassive ( $\sim 10^{11} M_{\odot}$ ) Dark Core in the Luminous Infrared Galaxy NGC 6240? *Jonathan Bland-Hawthorn, Andrew S. Wilson, & R. Brent Tully.* 371, L19, 66-C7 (1991)

Angular Momentum and Stripping in Tidal Interactions. *Thomas A. McGlynn & Kirk D. Borne.* 372, 31, 74-D7 (1991)

- Optical Properties and Dynamics of Galaxies in the Hickson Compact Groups.** *Vera C. Rubin, Deidre A. Hunter, & W. Kent Ford, Jr.* 76, 153, 26-A1 (1991)
- Near-Infrared Long-Slit Spectroscopy of IRAS 14348–1447.** *Tadashi Nakajima, Kimiaki Kawara, Minoru Nishida, & Brooke Gregory.* 373, 452, 93-E6 (1991)
- New Observations of the Gas Cloud Associated with the Quasar-Galaxy Pair 3C 232/NGC 3067.** *John T. Stocke, James Case, Megan Donahue, J. Michael Shull, & Theodore P. Snow.* 374, 72, 98-G7 (1991)
- H I Deficiency in Cluster Spiral Galaxies: Dependence on Galaxy Size.** *Monica Válluri & Chanda J. Jog.* 374, 103, 99-C7 (1991)
- Infrared Fluorescence of H<sub>2</sub> in NGC 6240: A Starburst Origin for the H<sub>2</sub> Luminosity.** *Masuo Tanaka, Tetsuo Hasegawa, & Ian Gatley.* 374, 516, 105-E9 (1991)
- Dynamical Segregation of Direct and Retrograde Orbits in Binary Disk Galaxies.** *William C. Keel.* 375, L5, 117-A13 (1991)
- A Limit on the Cosmological Constant.** *R. G. Carlberg.* 375, 429, 118-B1 (1991)
- Orbital Decay in Aspherical Galaxies. II. Triaxial Systems.** *Thomas S. Statler.* 375, 544, 119-E1 (1991)
- Are Hypernovae Detectable?** *Seok Jae Park & Ethan T. Vishniac.* 375, 565, 119-F9 (1991)
- The Properties of NGC 2777: Are Companion Galaxies Young?** *Halton Arp & Jack W. Sulentic.* 375, 569, 119-G1 (1991)
- The Accuracy of Galaxy Masses from the Timing Argument.** *T. L. Kroeker & R. G. Carlberg.* 376, 1, 125-B1 (1991)
- A Numerical Study of Star Formation in Interacting Disk Galaxies.** *J. Christopher Mihos, Douglas O. Richstone, & Gregory D. Bothun.* 377, 72, 139-A1 (1991)
- Infrared Emission Regions in the Interacting Galaxy System Arp 299.** *C. G. Wynn-Williams, S. A. Eales, E. E. Becklin, K.-W. Hodapp, R. D. Joseph, I. S. McLean, D. A. Simons, & G. S. Wright.* 377, 426, 145-A13 (1991)
- The Discovery of a Long H I Plume near the Peculiar Galaxy NGC 2782 (Arp 215).** *Beverly J. Smith.* 378, 39, 151-E1 (1991)
- Clusters of Galaxies Associated with Quasars. II. Galaxy Cluster Dynamics.** *E. Ellingson, R. F. Green, & H. K. C. Yee.* 378, 476, 158-D1 (1991)
- Massive Star Formation and Superwinds in IRAS 19254–7245 (The "Superantennae").** *Luis Colina, Sebastian Lipari, & F. Macchetto.* 379, 113, 164-D5 (1991)
- The Luminosity Function of Compact Groups of Galaxies.** *Cláudia Mendes de Oliveira & Paul Hickson.* 380, 30, 176-D5 (1991)
- Recent Star Formation in the Interacting Galaxy System NGC 520.** *S. A. Stanford.* 381, 409, 195-G1 (1991)
- The Extraordinary Radio Source 3C 442.** *Neil F. Comins & Frazer N. Owen.* 382, 108, 201-E1 (1991)
- GALAXIES: INTERGALACTIC MEDIUM**
- The Metal Abundance and Specific Energy of Intracluster Gas.** *Raymond E. White III.* 367, 69, 12-G8 (1991)
- Cosmic Backgrounds from Primeval Dust.** *J. R. Bond, B. J. Carr, & C. J. Hogan.* 367, 420, 18-F1 (1991)
- A Study of Two Absorption-Line Complexes in the Quasar UM 402 ≡ Q0207–003.** *E. Joseph Wampler.* 368, 40, 23-E11 (1991)
- Expansion-cooled Lyman-Alpha Clouds.** *Robert C. Duncan, Ethan T. Vishniac, & Jeremiah P. Ostriker.* 368, L1, 28-B1 (1991)
- Diffuse Light in Dense Clusters of Galaxies. I. R-Band Observations of Abell 2029.** *Juan M. Uson, Stephen P. Boughn, & Jeffrey R. Kuhn.* 369, 46, 36-E7 (1991)
- Far-Infrared Counterpart to the Optical and H I Plume in the Leo Triplet of Galaxies: NGC 3623, NGC 3627, and NGC 3628.** *D. H. Hughes, P. N. Appleton, & J. M. Schombert.* 370, 176, 49-C11 (1991)
- The Shape of the Ultraviolet Continuum of Quasars and Intergalactic Dust.** *F. H. Cheng, C. Martin Gaskell, & Anuradha P. Koratkar.* 370, 487, 54-D9 (1991)
- Fueling Starburst Galaxies with Gas-rich Mergers.** *Joshua E. Barnes & Lars E. Hernquist.* 370, L65, 59-B7 (1991)
- Dust from Early Galaxies and the X-Ray Background Radiation.** *B. Rudak & P. Mészáros.* 371, 29, 60-D5 (1991)
- Statistical Analysis of Power-Size-Redshift Distributions of Extragalactic Jets.** *Alexander Rosen & Paul J. Wiita.* 371, 501, 67-F10 (1991)
- The Hydrodynamics of Relict Cosmological H II Regions and the Formation of Objects at High Redshift.** *Piero Madau & Avery Meiksin.* 374, 6, 98-B7 (1991)
- Unsaturated Comptonization of Isotropic Photon Spectra by Relativistic Electrons.** *Abraham Loeb, Christopher F. McKee, & Ofer Lahav.* 374, 44, 98-E5 (1991)
- Optical Coronal Emission Lines from Cooling Flows in Elliptical Galaxies and Galaxy Clusters.** *Craig L. Sarazin & Christopher M. Graney.* 375, 532, 119-D3 (1991)
- The Distribution of Dark Matter in the Perseus Cluster.** *C. J. Eyles, M. P. Watt, D. Bertram, M. J. Church, T. J. Ponman, G. K. Skinner, & A. P. Willmore.* 376, 23, 125-C12 (1991)
- Lyman-Alpha Depression of the Continuum from High-Redshift Quasars: A New Technique Applied in Search of the Gunn-Peterson Effect.** *Edward B. Jenkins & Jeremiah P. Ostriker.* 376, 33, 125-D9 (1991)
- The X-Ray Cooling Flow in the Cluster of Galaxies around PKS 2354–35.** *Daniel A. Schwartz, Hale V. Bradt, Ronald A. Remillard, & I. R. Tuohy.* 376, 424, 131-F6 (1991)
- QSO Absorption Systems and the Origin of the Ionizing Background at High Redshift.** *Piero Madau.* 376, L33, 137-B4 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Ultraviolet Spectra of a Starburst Knot in NGC 1068.** *J. B. Hutchings, F. Bruhweiler, A. Boggess, S. R. Heap, D. Ebbe, E. Beaver, E. Rosenthal, K. Q. Truong, M. Perez, & R. Westmacott.* 377, L25, 143-D1 (1991)
- Cosmic-Ray Heating of Cooling Flows: A Critical Analysis.** *Michael Loewenstein, Ellen G. Zweibel, & Mitchell C. Begelman.* 377, 392, 144-F4 (1991)
- A ~10 Mpc Void in the Lyα Forest at z = 3.17.** *Adam Dobrucki & Jill Bechtold.* 377, L69, 150-B10 (1991)
- Confirmation of Dust in Damped Lyman-Alpha Systems.** *Yichuan C. Pei, S. Michael Fall, & Jill Bechtold.* 378, 6, 151-B4 (1991)
- Detection of Excess Rotation Measure Due to Intracluster Magnetic Fields in Clusters of Galaxies.** *K.-T. Kim, Peter C. Tribble, & P. P. Kronberg.* 379, 80, 164-A5 (1991)
- The Carbon Abundance of the Lyman-Alpha Clouds.** *Limin Lu.* 379, 99, 164-C1 (1991)
- A Measurement of the Value of the Hubble Constant from the X-Ray Properties and the Sunyaev-Zel'dovich Effect of Abell 665.** *M. Birkshaw, J. P. Hughes, & K. A. Arnaud.* 379, 466, 170-E1 (1991)
- Spectroscopic Limits to an Extragalactic Far-Ultraviolet Background.** *Christopher Martin, Mark Hurwitz, & Stuart Bowyer.* 379, 549, 171-D10 (1991)
- Enrichment and Heating of the Intracluster Medium through Galactic Winds.** *L. P. David, W. Forman, & C. Jones.* 380, 39, 176-E1 (1991)
- Turbulently Generated Magnetic Fields in Clusters of Galaxies.** *Izthak Goldman & Yoel Rephaeli.* 380, 344, 182-E8 (1991)
- Bounds on Intergalactic Compact Objects from Observations of Compact Radio Sources.** *Aggeliki Kassiola, Israel Kovner, & Roger D. Blandford.* 381, 6, 189-B4 (1991)
- The Evolution of the Diffuse Cosmic Ultraviolet Background Constrained by Hubble Space Telescope Observations of 3C 273.** *Satoru Ikeuchi & Edwin L. Turner.* 381, L1, 194-A9 (1991)
- A Photoionization Model for the Optical Line Emission from Cooling Flows.** *Megan Donahue & G. Mark Voit.* 381, 361, 195-C1 (1991)
- Observations of Ca II Absorption along the Nearly Parallel Lines of Sight toward 3C 273 and SN 1991T.** *David M. Meyer & Katherine C. Roth.* 383, L41, 226-B11 (1991)
- GALAXIES: INTERNAL MOTIONS**
- Hamiltonian Dynamics of Self-gravitating Ellipsoids.** *G. Rosensteel & Huy Q. Tran.* 366, 30, 1-D9 (1991)
- Galaxy Velocity Dispersions Using a Cross-Correlation Method.** *Cristina Dalle Ore, S. M. Faber, J. Jesús González, Roland Stoughton, & David Burstein.* 366, 38, 1-E5 (1991)
- Kinematics and Ionization of Extended Gas in Active Galaxies. VI. The Seyfert 2 Galaxy NGC 1386.** *K. A. Weaver, A. S. Wilson, & J. A. Baldwin.* 366, 50, 1-F5 (1991)
- The Galactic Disk Surface Mass Density and the Galactic Force K<sub>z</sub> at z = 1.1 Kiloparsecs.** *Konrad Kuijken & Gerard Gilmore.* 367, L9, 17-C1 (1991)

- Criticism of Lake's Analysis of the Rotation Curves of Dwarf Spirals.** *Mordehai Milgrom*. 367, 490, 19-D11 (1991)
- New Velocity Dispersions and Photometry for E and S0 Galaxies in the Great Attractor.** *Alan Dressler, S. M. Faber, & David Burstein*. 368, 54, 23-G1 (1991)
- The Universal Galaxy Rotation Curve.** *Massimo Persic & Paolo Salucci*. 368, 60, 23-G9 (1991)
- A Search for Instability in Two Families of Spherical Stellar Models.** *Martin D. Weinberg*. 368, 66, 24-A1 (1991)
- Extended Stellar Hydrodynamics for Galactic Disks.** *Peter Amendt & Phil Cuddeford*. 368, 79, 24-B1 (1991)
- Hydrodynamic Constraints on the Radial Structure of Late-Type Galaxy Disks.** *Curtis Struck-Marcell*. 368, 348, 29-D5 (1991)
- A Study of the Structure and Kinematics of the Narrow-Line Region in Seyfert Galaxies. I. Atlas of Line Profiles.** *Sylvain Veilleux*. 75, 357, 5-F1 (1991)
- A Study of the Structure and Kinematics of the Narrow-Line Region in Seyfert Galaxies. II. Analysis of the Line-Profile Parameters.** *Sylvain Veilleux*. 75, 383, 6-A1 (1991)
- The Ring Instability in Radially Cold Oblate Galaxy Models.** *Tim de Zeeuw & Martin Schwarzschild*. 369, 57, 36-F7 (1991)
- A Merger Scenario for NGC 7252: A Tale of Two Tails.** *Kirk D. Borne & Douglas O. Richstone*. 369, 111, 37-C11 (1991)
- A Study of the Structure and Kinematics of the Narrow-Line Region in Seyfert Galaxies. III. Individual Objects.** *Sylvain Veilleux*. 369, 331, 42-A1 (1991)
- Compression of Dark Halos by Baryon Infall: Self-similar Solutions.** *Barbara S. Ryden*. 370, 15, 47-C1 (1991)
- The Shape of the Galaxy.** *Leo Blitz & David N. Spergel*. 370, 205, 49-F11 (1991)
- Extragalactic Globular Clusters. II. The M31 Globular Cluster System.** *John P. Huchra, Jean P. Brodie, & Stephen M. Kent*. 370, 495, 54-E5 (1991)
- Fueling Starburst Galaxies with Gas-rich Mergers.** *Joshua E. Barnes & Lars E. Hernquist*. 370, L65, 59-B7 (1991)
- Mapping of Infrared Helium and Hydrogen Line Profiles in the Central Few Arcseconds of the Galaxy.** *T. R. Geballe, K. Krisciunas, J. A. Bailey, & R. Wade*. 370, L73, 59-C8 (1991)
- Three-dimensional Models of a Galactic Wind Expansion with Ellipsoidal Geometry. I. The Hydrodynamical Test Case.** *H. Fichtner, W. Neusch, H. J. Fahr, & R. Schlickeiser*. 371, 98, 61-C9 (1991)
- The Neutral Hydrogen Distribution of NGC 3079.** *Judith A. Irwin & E. R. Seaquist*. 371, 111, 61-D9 (1991)
- Ultramassive ( $\sim 10^{11} M_{\odot}$ ) Dark Core in the Luminous Infrared Galaxy NGC 6240?** *Jonathan Bland-Hawthorn, Andrew S. Wilson, & R. Brent Tully*. 371, L19, 66-C7 (1991)
- Hydrodynamics of the Hot Component of the Galactic Halo. I. Steady State Solutions.** *G. Einaudi & A. Ferrara*. 371, 571, 68-E12 (1991)
- The Distribution and Kinematics of Neutral Gas in M31.** *Robert Braun*. 372, 54, 74-F6 (1991)
- Ultraviolet Interstellar Absorption toward HD 156359, a Halo Star at 11 Kiloparsecs in the Direction  $l = 329^{\circ}$  and  $b = -15^{\circ}$ .** *Kenneth R. Sembach, Blair D. Savage, & Derck Massa*. 372, 81, 75-A11 (1991)
- The Stability of Cold, Flattened, Self-gravitating Disks Obeying Other than Newtonian Force Laws.** *Dimitris M. Christodoulou*. 372, 471, 81-F1 (1991)
- The Halo of the Large Magellanic Cloud: Kinematics of the CH Stars.** *A. P. Cowley & F. D. A. Hartwick*. 373, 80, 87-A8 (1991)
- Optical Properties and Dynamics of Galaxies in the Hickson Compact Groups.** *Vera C. Rubin, Deidre A. Hunter, & W. Kent Ford, Jr.* 76, 153, 26-A1 (1991)
- Testing the Gravitational Field in Elliptical Galaxies: NGC 5077.** *Francesco Bertola, Daniela Bettoni, John Danziger, Elaine Sadler, Linda Sparke, & Tim de Zeeuw*. 373, 369, 92-E10 (1991)
- Vertical Oscillation of the Galactic Disk.** *Martin D. Weinberg*. 373, 391, 92-G7 (1991)
- A Catalog of Spin Orientation of Southern Galaxies.** *Masanori Iye & Hajime Sugai*. 374, 112, 99-D3 (1991)
- Extraplanar Ionized Gas and Kinematics in the Edge-on Galaxy NGC 891.** *Jean W. Keppel, Ralf-Jürgen Detmar, John S. Gallagher III, & Morton S. Roberts*. 374, 507, 105-D6 (1991)
- Fundamental Parameters of Brightest Cluster Galaxies.** *William R. Oegerle & John G. Hoessel*. 375, 15, 111-B13 (1991)
- Global Stability of Self-similar Newtonian Gaseous Disks against Axisymmetric Perturbations.** *José P. S. Lemos, Agnieszka Kalnajs, & Donald Lynden-Bell*. 375, 484, 118-G1 (1991)
- Orbital Decay in Aspherical Galaxies. II. Triaxial Systems.** *Thomas S. Statler*. 375, 544, 119-E1 (1991)
- Resonance Excitation of Spiral Density Waves in a Gaseous Disk. II. A Nonlinear Theory and Application to the 3 Kiloparsec Arm.** *Chi Yuan & Ye Cheng*. 376, 104, 126-C3 (1991)
- Stability of Nonrotating Stellar Systems. II. Prolate Shell-Orbit Models.** *David Merritt & Lars Hernquist*. 376, 439, 131-G13 (1991)
- Arm Classification and Velocity Gradients in Spiral Galaxies.** *A. Biviano, M. Girardi, G. Giuricin, F. Mardirossian, & M. Mezzetti*. 376, 458, 132-B7 (1991)
- Galactic Disk Warps.** *Konrad Kuijken*. 376, 467, 132-C4 (1991)
- Modes of Oscillation of a Uniformly Rotating, Homogeneous Spheroid of Stars.** *Peter O. Vandervoort*. 377, 49, 138-F1 (1991)
- H I Studies of the Sculptor Group Galaxies. VII. Implications on the Distribution and Nature of Dark Matter in Groups.** *Daniel Puche & Claude Carignan*. 378, 487, 158-E1 (1991)
- The Dark Matter Content of Spiral Galaxies.** *Paolo Salucci, Keith M. Ashman, & Massimo Persic*. 379, 89, 164-B1 (1991)
- Massive Star Formation and Superwinds in IRAS 19254–7245 (The "Superantennae").** *Luis Colina, Sebastian Llupiá, & F. Macchietto*. 379, 113, 164-D5 (1991)
- Dynamics of Cooling Gas in Galactic Dark Halos.** *Julio F. Navarro & Willy Benz*. 380, 320, 182-C7 (1991)
- Population Studies. XI. The Extended Disk, Halo Configuration.** *John E. Norris & Sean G. Ryan*. 380, 403, 183-C6 (1991)
- The H I Content of the Local Group Dwarf (Spheroidal or Irregular?) Galaxy Phoenix.** *Claude Carignan, Serge Demers, & Stéphanie Côté*. 381, L13, 194-C1 (1991)
- Spectroscopy of Spatially Extended Material around High-Redshift Radio-loud Quasars.** *Timothy M. Heckman, Matthew D. Lehner, George K. Miley, & Wil van Breugel*. 381, 373, 195-D1 (1991)
- 3C 390.3: Modeling Variable Profile Humps.** *Wei Zheng, Sylvain Veilleux, & Steven A. Grandi*. 381, 418, 196-A1 (1991)
- Vertical Distribution and Support of Galactic H I.** *Felix J. Lockman & Curtis S. Gehman*. 382, 182, 202-D12 (1991)
- Is the Kinematically Distinct Core in NGC 5982 Necessarily the Remnant of an Accreted Companion?** *Thomas S. Statler*. 382, L11, 205-B7 (1991)
- Neutral Hydrogen Observations of Galaxies in Superclusters.** *M. P. Haynes & R. Giovanelli*. 77, 331, 49-B1 (1991)
- The Ordered Nature of Elliptical Galaxies: Implications for Their Intrinsic Angular Momenta and Shapes.** *Marijn Franx, Garth Illingworth, & Tim de Zeeuw*. 383, 112, 213-D7 (1991)
- On the Effects of Interstellar Gas on the Oscillations and the Stability of Galaxies.** *Peter O. Vandervoort*. 383, 498, 220-E1 (1991)
- GALAXIES: INTERSTELLAR MATTER**
- Giant Molecular Clouds and the CO-to-H<sub>2</sub> Conversion Factor in IC 10.** *Christine D. Wilson & I. Neill Reid*. 366, L11, 6-B7 (1991)
- The Star-forming Disk and CO Bar in M101.** *Jeffrey D. P. Kenney, Nick Z. Scoville, & Christine D. Wilson*. 366, 432, 8-C1 (1991)
- Photolevelitation of Diffuse Clouds.** *José Franco, Federico Ferrini, Andrea Ferrara, & Bruno Barnesella*. 366, 443, 8-D1 (1991)
- Simulations of the Supernova-dominated Interstellar Medium in Disk Galaxies.** *Denis F. Cioffi & J. Michael Shull*. 367, 96, 13-B13 (1991)
- Millimeter Interferometer Observations of Infrared Luminous Galaxies: NGC 828 and NGC 6240.** *Z. Wang, N. Z. Scoville, & D. B. Sanders*. 368, 112, 24-D9 (1991)
- High-Excitation Extranuclear Gas in Seyfert Galaxies.** *Christopher A. Haniff, Martin J. Ward, & Andrew S. Wilson*. 368, 167, 25-B5 (1991)
- CO Excitation and H<sub>2</sub> Masses of Infrared-luminous Galaxies.** *Simon J. E. Radford, P. M. Solomon, & D. Downes*. 368, L15, 28-C7 (1991)
- Stripped Interstellar Gas in Cluster Cooling Flows.** *Noam Soker, Joel N. Bregman, & Craig L. Sarazin*. 368, 341, 29-C10 (1991)
- Evolution of the Interstellar Medium in Elliptical Galaxies. II. X-Ray Properties.** *L. P. David, W. Forman, & C. Jones*. 369, 121, 37-D9 (1991)
- Infrared Mapping of M82: A Starburst in an Edge-on Barred Galaxy.** *C. M. Telesco, H. Campins, M. Joy, K. Dietz, & R. Decher*. 369, 135, 37-E11 (1991)

- High-Resolution Aperture Synthesis of Molecular Gas in NGC 1068.** *P. Planesas, N. Scoville, & S. T. Myers.* 369, 364, 42-C9 (1991)
- Spatially Resolved Optical Images of High-Redshift Quasi-stellar Objects.** *Timothy M. Heckman, Matthew D. Lehnert, Wil van Breugel, & George K. Miley.* 370, 78, 48-A7 (1991)
- Relics of an Eruptive Starburst in NGC 1569.** *William H. Waller.* 370, 144, 48-G12 (1991)
- Molecular Gas in Luminous Infrared Galaxies.** *D. B. Sanders, N. Z. Scoville, & B. T. Soifer.* 370, 158, 49-B1 (1991)
- High-Resolution CO Observations of Luminous Infrared Galaxies with Large  $L_{\text{IR}}/L_B$  Ratios:** IRAS 10173+0828, Zw 049.057, IRAS 17208-0014. *P. Planesas, I. F. Mirabel, & D. B. Sanders.* 370, 172, 49-C5 (1991)
- OB Star Formation and H I Production in Molecular Clouds in M33.** *Christine D. Wilson & Nick Scoville.* 370, 184, 49-D11 (1991)
- Interstellar Matter in Early-Type Galaxies. I. The Catalog.** *Morton S. Roberts, David E. Hogg, Joel N. Bregman, William R. Forman, & Christine Jones.* 75, 751, 11-F5 (1991)
- The Escape of Lyman-Alpha Radiation from a Multiphase Interstellar Medium.** *David A. Neufeld.* 370, L85, 59-D13 (1991)
- High Chemical Abundances in Virgo Spiral Galaxies?** *Gregory A. Shields, Evan D. Skillman, & Robert C. Kennicutt, Jr.* 371, 82, 61-B1 (1991)
- The Neutral Hydrogen Distribution of NGC 3079.** *Judith A. Irwin & E. R. Sequist.* 371, 111, 61-D9 (1991)
- Far-Infrared Properties of NGC 6822.** *John S. Gallagher III, Deidre A. Hunter, Fred C. Gillett, & Walter L. Rice.* 371, 142, 61-G1 (1991)
- The Rate and Efficiency of High-Mass Star Formation along the Hubble Sequence.** *Nicholas A. Devereux & Judith S. Young.* 371, 515, 68-A1 (1991)
- Detection of CO Emission in the Elliptical Galaxies NGC 3265 and NGC 5666.** *M. A. Gordon.* 371, 563, 68-E1 (1991)
- The Distribution and Kinematics of Neutral Gas in M31.** *Robert Braun.* 372, 54, 74-F6 (1991)
- The Molecular Interstellar Medium and the Near-Infrared Continuum of the Barred LINER NGC 6764.** *A. Eckart, M. Cameron, J. M. Jackson, R. Genzel, A. I. Harris, W. Wild, & H. Zinnecker.* 372, 67, 74-G9 (1991)
- The Influence of High-Density Environment on the Radio—Far-Infrared Correlation of Spiral Galaxies.** *T. K. Menon.* 372, 419, 81-A7 (1991)
- The Far-Infrared Morphology of the Double-ringed Galaxy NGC 4736 (M94): A Ring Surrounding an Extended Nucleus.** *Beverly J. Smith, D. F. Lester, P. M. Harvey, & R. W. Pogge.* 373, 66, 86-G5 (1991)
- Gaseous Halos of Elliptical Galaxies, the Cosmic Evolution of Their Radio Sizes, and the Phenomenon of Compact Steep-Spectrum Sources.** *Gopal-Krishna & Paul J. Wiita.* 373, 325, 92-B1 (1991)
- H I Mapping of Galaxies in the Cluster A1367.** *John M. Dickey & Giuseppe Gavazzi.* 373, 347, 92-C12 (1991)
- Molecular Clouds in Starburst Galaxy Nuclei.** *Judith S. Young & Nicholas A. Devereux.* 373, 414, 93-B6 (1991)
- The 158 Micron [C II] Line: A Measure of Global Star Formation Activity in Galaxies.** *G. J. Stacey, N. Geis, R. Genzel, J. B. Lugten, A. Poglitsch, A. Sternberg, & C. H. Townes.* 373, 423, 93-C1 (1991)
- Hot Gas Metallicity and the History of Supernova Activity in Elliptical Galaxies.** *Michael Loewenstein & William G. Mathews.* 373, 445, 93-D11 (1991)
- H I Deficiency in Cluster Spiral Galaxies: Dependence on Galaxy Size.** *Monica Valluri & Chanda J. Jog.* 374, 103, 99-C7 (1991)
- Time Evolution of Interstellar Dust and Far-Infrared Luminosity of Disk Galaxies.** *Boqi Wang.* 374, 456, 104-G1 (1991)
- Integrated Far-Infrared Background from Galaxies.** *Boqi Wang.* 374, 465, 104-G12 (1991)
- The Detection of X-Rays from the Hot Interstellar Medium of the Large Magellanic Cloud.** *Q. Wang, T. Hamilton, D. J. Helfand, & X. Wu.* 374, 475, 105-A10 (1991)
- Ram-Pressure Stripping of the Multiphase Interstellar Medium of the Virgo Cluster Elliptical Galaxy M86 (NGC 4406).** *David A. White, A. C. Fabian, W. Forman, C. Jones, & C. Stern.* 375, 35, 111-D9 (1991)
- The CO Luminosity Function of Galaxies.** *Frances Verter.* 375, 95, 112-B11 (1991)
- The Interstellar Medium of the Hot-Spot Galaxy NGC 2903.** *James M. Jackson, Andreas Eckart, Murray Cameron, Wolfgang Wild, Paul T. P. Ho, Richard W. Pogge, & Andrew I. Harris.* 375, 105, 112-C9 (1991)
- The Properties of NGC 2777: Are Companion Galaxies Young?** *Halton Arp & Jack W. Sulentic.* 375, 569, 119-G1 (1991)
- Imaging Spectrophotometry of Ionized Gas in NGC 1068. III. Anisotropic Excitation of the Large-Scale Disk by Scattering of Nuclear Continuum.** *James Sokolowski, Jonathan Bland-Hawthorn, & Gerald Cecil.* 375, 583, 120-A1 (1991)
- Origins of the 12–200 Micron Flux in NGC 6946: Starlight and Continuum Dust Emission from an Sc Galaxy.** *G. Engargiola.* 76, 875, 36-G5 (1991)
- X-Ray Halos as Diagnostics of Interstellar Grains.** *John S. Mathis & C.-W. Lee.* 376, 490, 132-E1 (1991)
- CO (3–2) Mapping and Gas Excitation in the Core of M82.** *R. P. J. Tilanus, L. J. Tacconi, E. C. Sutton, S. Zhou, D. B. Sanders, C. G. Wynn-Williams, K. Y. Lo, & S. A. Stephens.* 376, 500, 132-E13 (1991)
- Very Small Grains and the Infrared Colors of Galaxies.** *G. Helou, C. Ryter, & B. T. Soifer.* 376, 505, 132-F6 (1991)
- Neutral Hydrogen in the Outer Galaxy.** *Athanassios Diplas & Blair D. Savage.* 377, 126, 139-E5 (1991)
- The Molecular Structure of a Starburst:  $^{13}\text{CO}$  in the Nucleus of Maffei 2.** *Robert L. Hurt & Jean L. Turner.* 377, 434, 145-B8 (1991)
- The Detection of the Hot Gaseous Halo around the Small Magellanic Cloud.** *Qingde Wang.* 377, L85, 150-D1 (1991)
- The Discovery of a Long H I Plume near the Peculiar Galaxy NGC 2782 (Arp 215).** *Beverly J. Smith.* 378, 39, 151-E1 (1991)
- Attenuation of Lyman-Alpha Emission by Dust in Damped Lyman-Alpha Systems.** *Stéphane Charlot & S. Michael Fall.* 378, 471, 158-C7 (1991)
- X-Ray Irradiation of Interstellar Grains in Active Galaxies: Evaporation and Infrared Spectra.** *G. Mark Voit.* 379, 122, 164-E1 (1991)
- Molecular Gas in Elliptical Galaxies.** *Joanna F. Lees, G. R. Knapp, Michael P. Rupen, & T. G. Phillips.* 379, 177, 165-B11 (1991)
- Spectroscopic Limits to an Extragalactic Far-Ultraviolet Background.** *Christopher Martin, Mark Hurwitz, & Stuart Bowyer.* 379, 549, 171-D10 (1991)
- A COSMOS Study of the Structure and Content of NGC 6822.** *Paul Hodge, Toby Smith, Paul Eskridge, Harvey MacGillivray, & Steven Beard.* 379, 621, 172-D1 (1991)
- Molecular Gas Excitation in NGC 253.** *W. F. Wall, D. T. Jaffe, F. P. Israel, & F. N. Bash.* 380, 384, 183-A11 (1991)
- Star Formation and the Molecular Content of IC 342.** *Leslie J. Sage & P. M. Solomon.* 380, 392, 183-B7 (1991)
- Possible Deflection of a Jet by Molecular Clouds in NGC 4258.** *R. L. Plante, K. Y. Lo, Jean-René Roy, Pierre Martin, & Louis Noreau.* 381, 110, 190-D4 (1991)
- Orbit Crowding of Molecular Gas at a Bar-Spiral Arm Transition Zone in M83.** *Jeffrey D. P. Kenney & Steven D. Lord.* 381, 118, 190-D13 (1991)
- A Molecular Gas Ridge Offset from the Dust Lane in a Spiral Arm of M83.** *Steven D. Lord & Jeffrey D. P. Kenney.* 381, 130, 190-E13 (1991)
- Evolution of Dust Grains through a Hot Gaseous Halo.** *A. Ferrara, F. Ferrini, J. Franco, & B. Barsella.* 381, 137, 190-F9 (1991)
- The H I Content of the Local Group Dwarf (Spheroidal or Irregular?) Galaxy Phoenix.** *Claude Carignan, Serge Demers, & Stéphanie Côté.* 381, L13, 194-C1 (1991)
- Upper Limit on Interstellar Gas in Coma Cluster Ellipticals.** *Claude R. Canizares & Paula Blizzard.* 382, 79, 201-B1 (1991)
- The Discrete X-Ray Source Population in M31.** *G. Trinchieri & G. Fabbiano.* 382, 82, 201-B6 (1991)
- Polarized Radio Emission from the Edge-on Spiral Galaxies NGC 891 and NGC 4565.** *S. Sukumar & R. J. Allen.* 382, 100, 201-D1 (1991)
- Infrared Spectroscopy of Cygnus A: Implications for the Obscured Active Nucleus.** *Martin J. Ward, Philip R. Blanca, Andrew S. Wilson, & Minoru Nishida.* 382, 115, 201-E11 (1991)
- The Relationship between the Carbon Monoxide Intensity and the Radio Continuum Emission in Spiral Galaxies.** *David S. Adler, Ronald J. Allen, & K. Y. Lo.* 382, 475, 207-D12 (1991)

- First Observations of the CO  $J = 6-5$  Transition in Starburst Galaxies.** *A. J. Harris, R. E. Hills, J. Stutzki, U. U. Graf, A. P. G. Russell, & R. Genzel.* 382, L75, 211-C7 (1991)
- The Ultraviolet Spectra of Nearby Radio Galaxies.** *William C. Keel & Roger A. Windhorst.* 383, 135, 213-F3 (1991)
- H II Regions in Seven Dwarf Irregular Galaxies.** *Nicolas V. Strobel, Paul Hodge, & Robert C. Kennicutt, Jr.* 383, 148, 213-G3 (1991)
- A Complete CO Survey of M31.** *E. Koper, T. M. Dame, F. P. Israel, & P. Thaddeus.* 383, L11, 219-B7 (1991)
- On the Effects of Interstellar Gas on the Oscillations and the Stability of Galaxies.** *Peter O. Vandervoort.* 383, 498, 220-E1 (1991)
- Effects of Internal Absorption on Galaxy Number Count and Redshift Distribution.** *Boqi Wang.* 383, L37, 226-B6 (1991)
- GALAXIES: JETS**
- An Infrared Jet in Centaurus A: A Link to the Extranuclear Activity in Distant Radio Galaxies?** *Marshall Joy, P. M. Harvey, E. V. Tollestrup, K. Sellgren, P. J. McGregor, & A. R. Hyland.* 366, 82, 2-A13 (1991)
- Oblique Mixed Shocks in Extragalactic Jets.** *D. Fraix-Burnet & G. Pelleter.* 367, 86, 13-B1 (1991)
- Fanaroff-Riley I Galaxies as the Parent Population of BL Lacertae Objects. II. Optical Constraints.** *P. Padovani & C. M. Urry.* 368, 373, 29-F6 (1991)
- Numerical Simulations of a Restarting Jet.** *David A. Clarke & Jack O. Burns.* 369, 308, 41-E4 (1991)
- First Results from the Faint Object Camera: Observations of PKS 0521-36.** *F. Macchetto, R. Albrecht, C. Barbieri, J. C. Blades, A. Boksenberg, P. Crane, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kamperman, I. R. King, C. D. Mackay, F. Paresce, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, & W. B. Sparks.* 369, L55, 46-A1 (1991)
- Altered Luminosity Functions for Relativistically Beamed Objects. II. Distribution of Lorentz Factors and Parent Populations with Complex Luminosity Functions.** *C. M. Urry & P. Padovani.* 371, 60, 60-G5 (1991)
- The Deflection of Cosmic Jets.** *David S. De Young.* 371, 69, 61-A1 (1991)
- Multifrequency VLA, VLBI, and Single-Dish Observations of the Quasar 4C 39.25.** *Alan P. Marscher, Yun Fei Zhang, David B. Shaffer, Hugh D. Aller, & Margo F. Aller.* 371, 491, 67-E12 (1991)
- Statistical Analysis of Power-Size-Redshift Distributions of Extragalactic Jets.** *Alexander Rosen & Paul J. Wiita.* 371, 501, 67-F10 (1991)
- OX 169: Evidence for a Recent Merger.** *Alan Stockton & Tony Farnham.* 371, 525, 68-A13 (1991)
- Correlated Radio and Optical Variability in the BL Lacertae Object 0716+714.** *A. Quirrenbach, A. Witzel, S. Wagner, F. Sanchez-Pons, T. P. Krichbaum, R. Wegner, K. Anton, U. Erkens, M. Haehnelt, J. A. Zensus, & K. J. Johnston.* 372, L71, 85-C9 (1991)
- Atmospheric Gradients and the Stability of Expanding Jets.** *Philip E. Hardee, Michael L. Norman, Theodoros Kouvelis, & David A. Clarke.* 373, 8, 86-B10 (1991)
- Gaseous Halos of Elliptical Galaxies, the Cosmic Evolution of Their Radio Sizes, and the Phenomenon of Compact Steep-Spectrum Sources.** *Gopal-Krishna & Paul J. Wiita.* 373, 325, 92-B1 (1991)
- HST Observations of 3C 66B: A Double-stranded Optical Jet.** *F. Macchetto, R. Albrecht, C. Barbieri, J. C. Blades, A. Boksenberg, P. Crane, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kamperman, I. R. King, C. D. Mackay, F. Paresce, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, W. B. Sparks, & G. K. Miley.* 373, L55, 97-C10 (1991)
- Synchrotron Emission from Shocked Relativistic Jets. III. Models for the Centimeter Wave Band Quiescent and Burst Emission from 3C 279 and OT 081.** *P. A. Hughes, H. D. Aller, & M. F. Aller.* 374, 57, 98-F5 (1991)
- A Model for the Spectral Variability of BL Lacertae Objects at High Frequencies.** *A. Celotti, L. Maraschi, & A. Treves.* 377, 403, 144-G1 (1991)
- Coherent Radiation from Energetic Electron Streams via Collisionless Bremsstrahlung in Strong Plasma Turbulence.** *James C. Weatherall & Gregory Benford.* 378, 543, 159-B8 (1991)
- Heavy, Overpressured Jets and the Radio Source Hercules A.** *David L. Meier, Alberto C. Sadun, & Kevin R. Lind.* 379, 141, 164-F9 (1991)
- Depolarization Asymmetry in the Quasar 3C 47.** *Ilias Fernini, J. Patrick Leahy, Jack O. Burns, & John P. Basart.* 381, 63, 189-G1 (1991)
- Possible Deflection of a Jet by Molecular Clouds in NGC 4258.** *R. L. Plante, K. Y. Lo, Jean-René Roy, Pierre Martin, & Louis Noreau.* 381, 110, 190-D4 (1991)
- Fanaroff-Riley I Galaxies as the Parent Population of BL Lacertae Objects. III. Radio Constraints.** *C. M. Urry, P. Padovani, & M. Stickel.* 382, 501, 207-F13 (1991)
- Relativistic Electron-Positron Beam Formation in the Framework of the Two-Flow Model for Active Galactic Nuclei.** *Gilles Henri & Guy Pelleter.* 383, L7, 219-B1 (1991)
- Multifrequency Radio Observations of Cygnus A: Spectral Aging in Powerful Radio Galaxies.** *C. L. Carilli, R. A. Perley, J. W. Dreher, & J. P. Leahy.* 383, 554, 221-B9 (1991)
- GALAXIES: LOCAL GROUP**
- A Cosmos Study of IC 1613.** *Paul W. Hodge, Toby R. Smith, Paul B. Eskridge, Harvey T. MacGillivray, & Steven M. Beard.* 369, 372, 42-D5 (1991)
- New Cepheid Distances to Nearby Galaxies Based on BVRI CCD Photometry. II. The Local Group Galaxy M33.** *Wendy L. Freedman, Christine D. Wilson, & Barry F. Madore.* 372, 455, 81-D9 (1991)
- X-Ray Detectability of Gamma-Ray Bursts from M31.** *Edison P. Liang.* 380, L55, 188-B11 (1991)
- A Complete CO Survey of M31.** *E. Koper, T. M. Dame, F. P. Israel, & P. Thaddeus.* 383, L11, 219-B7 (1991)
- GALAXIES: MAGELLANIC CLOUDS**
- Photoionization Modeling of Magellanic Cloud Planetary Nebulae. I.** *M. A. Dopita & S. J. Meatheringham.* 367, 115, 13-D6 (1991)
- Chemical Evolution with Bursts of Star Formation: Element Ratios in Dwarf Galaxies.** *Gerard Gilmore & Rosemary F. G. Wyse.* 367, L55, 22-C1 (1991)
- A 12CO Survey of the Small Magellanic Cloud.** *M. Rubio, G. Garay, J. Montani, & P. Thaddeus.* 368, 173, 25-C1 (1991)
- Optical Spectroscopy of Magellanic Cloud Planetary Nebulae. I.** *Stephen J. Meatheringham & Michael A. Dopita.* 75, 407, 6-C9 (1991)
- Star Clusters in the Clouds of Magellan.** *Sidney van den Bergh.* 369, 1, 36-A11 (1991)
- Multiwavelength Observations of Nova LMC 1990 Number 2: The First Extragalactic Recurrent Nova.** *Steven N. Shore, George Sonneborn, Summer G. Starfield, M. Hamuy, R. E. Williams, A. Cassatella, & H. Drechsel.* 370, 193, 49-E8 (1991)
- An X-Ray Image of the Violent Interstellar Medium in 30 Doradus.** *Q. Wang & D. J. Helfand.* 370, 541, 55-B9 (1991)
- A Large Supershell H II Region Complex in the Large Magellanic Cloud and the Interstellar Environment of SN 1987A.** *Frederick C. Bruhweiler, Michelle A. Fitzurka, & Theodore R. Gull.* 370, 551, 55-C9 (1991)
- The Young Supernova Remnants N132D and 1E 0102.2-7219: Limits on the Presence of Rapidly Moving Sulfur.** *Barry M. Lasker & David A. Golimowski.* 371, 568, 68-E3 (1991)
- The Halo of the Large Magellanic Cloud: Kinematics of the CH Stars.** *A. P. Cowley & F. D. A. Hartwick.* 373, 80, 87-A8 (1991)
- DD 13: A Very Young and Heavily Reddened Early O Star in the Large Magellanic Cloud.** *Peter S. Conti & Edward L. Fitzpatrick.* 373, 100, 87-C5 (1991)
- The Structure and Evolution of Rich Star Clusters in the Large Magellanic Cloud.** *Rebecca A. W. Elson.* 76, 185, 26-E9 (1991)
- He II Emission in Extragalactic H II Regions.** *Donald R. Garnett, Robert C. Kennicutt, Jr., You-Hua Chu, & Evan D. Skillman.* 373, 458, 93-E14 (1991)
- The Detection of X-Ray Emission from the OB Associations of the Large Magellanic Cloud.** *Q. Wang & D. J. Helfand.* 373, 497, 94-B7 (1991)
- Cosmic-Ray Distribution and the Dynamic Balance in the Large Magellanic Cloud.** *Carl E. Fichsel, Mehmet E. Öz, Robert G. Stone, & P. Sreekumar.* 374, 134, 99-F7 (1991)
- LMC SMP 64: The Youngest Planetary Nebula?** *M. A. Dopita & S. J. Meatheringham.* 374, L21, 103-E1 (1991)

- The Detection of X-Rays from the Hot Interstellar Medium of the Large Magellanic Cloud.** *Q. Wang, T. Hamilton, D. J. Helfand, & X. Wu.* 374, 475, 105-A10 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Spectroscopic Determination of Stellar Parameters of Melnick 42, an O3f Star in the Large Magellanic Cloud.** *S. R. Heap, B. Altner, D. Ebbets, I. Hubeny, J. B. Hutchings, R. P. Kudritzki, S. A. Voels, S. Haser, A. Paudlitzsch, J. Puls, & K. Butler.* 377, L29, 143-D6 (1991)
- Photoionization Modeling of Magellanic Cloud Planetary Nebulae. II.** *M. A. Dopita & S. J. Meatheringham.* 377, 480, 145-F6 (1991)
- The Detection of the Hot Gaseous Halo around the Small Magellanic Cloud.** *Qingde Wang.* 377, L85, 150-D1 (1991)
- Optical Spectroscopy of Magellanic Cloud Planetary Nebulae. II.** *Stephen J. Meatheringham & Michael A. Dopita.* 76, 1085, 40-F7 (1991)
- LMC 2 as the Blowout of a Hot Superbubble.** *Qingde Wang & David J. Helfand.* 379, 327, 167-B5 (1991)
- The Intensity and Spectrum of the Diffuse X-Ray Background.** *X. Wu, T. Hamilton, D. J. Helfand, & Q. Wang.* 379, 564, 171-F1 (1991)
- Properties of the SN 1987A Circumstellar Ring and the Distance to the Large Magellanic Cloud.** *N. Panagia, R. Gilmozzi, F. Macchetto, H.-M. Adorf, & R. P. Kirshner.* 380, L23, 181-D1 (1991)
- Ionized Carbon in the Large Magellanic Cloud.** *R. T. Boreiko & A. L. Betz.* 380, L27, 181-D9 (1991)
- LMC X-4: Ginga Observations and Search for Orbital Period Changes.** *A. Levine, S. Rappaport, A. Putney, R. Corbet, & F. Nagase.* 381, 101, 190-C7 (1991)
- Detection of the Helium Flash Gap in the Integrated ( $B - V$ ) versus ( $B - V$ ) Diagram for 624 Large Magellanic Cloud Clusters.** *E. Bica, J. J. Clariá, H. Dottori, J. F. C. Santos, Jr., & A. Piatti.* 381, L51, 199-C7 (1991)
- Core Masses and Abundances of Low-Excitation Planetary Nebulae in the Magellanic Clouds.** *James B. Kaler & George H. Jacoby.* 382, 134, 201-G7 (1991)
- Cocoon Stars in the Large Magellanic Cloud.** *Neill Reid.* 382, 143, 202-A4 (1991)
- GALAXIES: NUCLEI**
- Kinematics and Ionization of Extended Gas in Active Galaxies. VI. The Seyfert 2 Galaxy NGC 1386.** *K. A. Weaver, A. S. Wilson, & J. A. Baldwin.* 366, 50, 1-F5 (1991)
- Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. I. An 8 Month Campaign of Monitoring NGC 5548 with IUE.** *J. Clavel, G. A. Reichen, D. Alloin, D. M. Crenshaw, G. Kriss, J. H. Krolik, M. A. Malkan, H. Netzer, B. M. Peterson, W. Wamsteker, A. Altamore, T. Baribaud, P. Barr, S. Beck, L. Binette, G. E. Brumage, N. Brosch, A. I. Diaz, A. V. Filippenko, K. Fricke, C. M. Gaskell, P. Giommi, I. S. Glass, P. Gondhalekar, R. L. Hackney, J. P. Halpern, D. J. Hutter, S. Jörssäter, A. L. Kinney, W. Kollatschny, A. Koratkar, K. T. Korista, A. Laor, J.-P. Lasota, E. Leibowitz, D. Maoz, P. G. Martin, T. Mazeh, E. J. A. Meurs, A. D. Nair, P. O'Brien, D. Petal, E. Perez, G. C. Perola, R. L. Ptak, P. Rodriguez-Pascual, E. I. Rosenblatt, A. C. Sadun, M. Santos-Lleo, R. A. Shaw, P. S. Smith, G. M. Stirpe, R. Stoner, W. H. Sun, M.-H. Ulrich, E. van Groningen, & W. Zheng.* 366, 64, 1-G7 (1991)
- An Infrared Jet in Centaurus A: A Link to the Extranuclear Activity in Distant Radio Galaxies?** *Marshall Joy, P. M. Harvey, E. V. Tollestrup, K. Sellgren, P. J. McGregor, & A. R. Hyland.* 366, 82, 2-A13 (1991)
- Dust and Gas in the Core of Arp 220 (IC 4553).** *N. Z. Scoville, A. I. Sargent, D. B. Sanders, & B. T. Soifer.* 366, L5, 6-A13 (1991)
- VLA Radio Recombination Line Observations of Sagittarius A West.** *D. A. Roberts, W. W. Goss, J. H. van Gorkom, & J. P. Leahy.* 366, L15, 6-B13 (1991)
- H II Regions in M82: High-Resolution Millimeter Continuum Observations.** *J. E. Carlstrom & Philipp P. Kronberg.* 366, 422, 8-B1 (1991)
- Accretion Disk Emission from a BL Lacertae Object.** *Amri Wandel & C. Megan Urry.* 367, 78, 13-A5 (1991)
- Effect of a QSO on the Interstellar Medium of Its Host Galaxy.** *Smita Shanbhag.* 367, 462, 19-B5 (1991)
- Structure of Thermal Pair Clouds around Gamma-Ray-emitting Black Holes.** *Edison P. Liang.* 367, 470, 19-C1 (1991)
- High-Rate Active Galaxy Monitoring at the Wise Observatory. III. The Broad-Line Region of NGC 4151.** *D. Maoz, H. Netzer, T. Mazeh, S. Beck, E. Almoznino, E. Leibowitz, N. Brosch, H. Mendelson, & A. Laor.* 367, 493, 19-E1 (1991)
- The Line-emitting Regions of the Exceptional Seyfert Galaxy Markarian 359.** *Sylvain Veilleux.* 368, 158, 25-A9 (1991)
- High-Excitation Extranuclear Gas in Seyfert Galaxies.** *Christopher A. Haniff, Martin J. Ward, & Andrew S. Wilson.* 368, 167, 25-B5 (1991)
- Fanaroff-Riley I Galaxies as the Parent Population of BL Lacertae Objects. II. Optical Constraints.** *P. Padovani & C. M. Urry.* 368, 373, 29-F6 (1991)
- Saturation of the Synchrotron Megamaser.** *André R. Crusius-Wätzel.* 368, 390, 30-A1 (1991)
- A Study of the Structure and Kinematics of the Narrow-Line Region in Seyfert Galaxies. I. Atlas of Line Profiles.** *Sylvain Veilleux.* 75, 357, 5-F1 (1991)
- A Study of the Structure and Kinematics of the Narrow-Line Region in Seyfert Galaxies. II. Analysis of the Line-Profile Parameters.** *Sylvain Veilleux.* 75, 383, 6-A1 (1991)
- The Number Count Distribution for X-Ray-selected BL Lacertae Objects and Constraints on the Luminosity Function.** *Anna Wolter, I. M. Gioia, T. Maccacaro, S. L. Morris, & J. T. Stocke.* 369, 314, 41-F5 (1991)
- A Study of the Structure and Kinematics of the Narrow-Line Region in Seyfert Galaxies. III. Individual Objects.** *Sylvain Veilleux.* 369, 331, 42-A1 (1991)
- HST Imaging of the Inner 3 Arcseconds of NGC 1068 in the Light of [O III]  $\lambda\lambda$  5007.** *I. N. Evans, H. C. Ford, A. L. Kinney, R. R. J. Antonucci, L. Armus, & S. Caganoff.* 369, L27, 45-C9 (1991)
- The Core of the Nearby S0 Galaxy NGC 7457 Imaged with the HST Planetary Camera.** *Tod R. Lauer, S. M. Faber, Jon A. Holtzman, William A. Baum, Douglas G. Currie, S. P. Ewald, Edward J. Groth, J. Jeff Hester, T. Kelsall, Jerome Kristian, Robert M. Light, C. Roger Lynds, Earl J. O'Neil, Jr., Edward J. Shaya, & James A. Westphal.* 369, L41, 45-E9 (1991)
- Dynamical and Luminosity Evolution of Active Galactic Nuclei: Models with a Mass Spectrum.** *Brian W. Murphy, Haldan N. Cohn, & Richard H. Durisen.* 370, 60, 47-G1 (1991)
- IC 5063: A Merger Remnant with a Hidden Luminous Active Nucleus.** *L. Colina, W. B. Sparks, & F. Macchetto.* 370, 102, 48-C5 (1991)
- High-Resolution CO Observations of Luminous Infrared Galaxies with Large  $L_{\text{IR}}/L_B$  Ratios:** *IRAS 10173+0828, Zw 049.057, IRAS 17208-0014.* *P. Planesas, I. F. Mirabel, & D. B. Sanders.* 370, 172, 49-C5 (1991)
- High-Resolution Imaging of Brackett- $\gamma$  and H<sub>2</sub> 1-0 S(1) Emission in the Seyfert Galaxy NGC 1068.** *V. Rotaciuc, A. Krabbe, M. Cameron, S. Drapatz, R. Genzel, A. Sternberg, & J. W. V. Storey.* 370, L23, 53-D6 (1991)
- Structure and Kinematics of the Broad-Line Regions in Active Galaxies from IUE Variability Data.** *Anuradha P. Koratkar & C. Martin Gaskell.* 75, 719, 11-B5 (1991)
- Two-Temperature Accretion Disks with Winds in a Fluid Approximation.** *Masaaki Kusunose.* 370, 505, 54-F1 (1991)
- The Origin of the Far-Infrared Continuum in Active Galactic Nuclei.** *L. K. Hunt.* 370, 511, 54-F9 (1991)
- Radius-Luminosity and Mass-Luminosity Relationships for Active Galactic Nuclei.** *Anuradha P. Koratkar & C. Martin Gaskell.* 370, L61, 59-B1 (1991)
- Fueling Starburst Galaxies with Gas-rich Mergers.** *Joshua E. Barnes & Lars E. Hernquist.* 370, L65, 59-B7 (1991)
- Far-Infrared Line and Continuum Observations of G0.095+0.012 and the E2 Thermal Radio Filament near the Galactic Center.** *Edwin F. Erickson, Sean W. J. Colgan, J. P. Simpson, Robert H. Rubin, Mark Morris, & Michael R. Haas.* 370, L69, 59-C1 (1991)
- Mapping of Infrared Helium and Hydrogen Line Profiles in the Central Few Arcseconds of the Galaxy.** *T. R. Geballe, K. Krisciunas, J. A. Bailey, & R. Wade.* 370, L73, 59-C8 (1991)
- Quasars and Active Galactic Nuclei in Rich Environments. II. The Evolution of Radio-loud Quasars.** *E. Ellingson, H. K. C. Yee, & R. F. Green.* 371, 49, 60-F7 (1991)
- Near-Infrared Long-Slit Spectra of NGC 1068.** *M. Tamura, S. G. Kleinmann, N. Z. Scoville, & R. R. Joyce.* 371, 131, 61-F3 (1991)

- C IV Line Profile Correlations in NGC 4151.** *R. P. Fahey, A. G. Michalitsianos, & D. Kazanas.* 371, 136, 61-F9 (1991)
- Ultramassive ( $\sim 10^{11} M_{\odot}$ ) Dark Core in the Luminous Infrared Galaxy NGC 6240?** *Jonathan Bland-Hawthorn, Andrew S. Wilson, & R. Brent Tully.* 371, L19, 66-C7 (1991)
- The Effect of Anisotropic Emission from Thick Accretion Disks on the Luminosity Functions of Active Galactic Nuclei.** *C. M. Urry, P. Marziani, & M. Calvani.* 371, 510, 67-G7 (1991)
- Ultraviolet Variability of NGC 5548: Dynamics of the Continuum Production Region and Geometry of the Broad-Line Region.** *J. H. Krolik, Keith Horne, T. R. Kallman, M. A. Malkan, R. A. Edelson, & G. A. Kriss.* 371, 541, 68-C6 (1991)
- A Comparison of C IV and H $\beta$  Broad Emission-Line Profiles in Low-Redshift Active Galactic Nuclei.** *Michael R. Corbin.* 371, L51, 73-B1 (1991)
- The Molecular Interstellar Medium and the Near-Infrared Continuum of the Barred LINER NGC 6764.** *A. Eckart, M. Cameron, J. M. Jackson, R. Genzel, A. I. Harris, W. Wild, & H. Zinnecker.* 372, 67, 74-G9 (1991)
- Magnetically Dominated Accretion onto Black Holes.** *Brian Punsly.* 372, 424, 81-B1 (1991)
- Correlated Radio and Optical Variability in the BL Lacertae Object 0716+714.** *A. Quirrenbach, A. Witzel, S. Wagner, F. Sanchez-Pons, T. P. Krichbaum, R. Wegner, K. Anton, U. Erkens, M. Hachnelt, J. A. Zensus, & K. J. Johnston.* 372, L71, 85-C9 (1991)
- Photoerosion and the Abundances of  $^7\text{Li}$ ,  $^9\text{Be}$ ,  $^{10}\text{B}$ , and  $^{11}\text{B}$  near Active Galactic Nuclei.** *R. N. Boyd & H. S. Fencl.* 373, 84, 87-A13 (1991)
- The Bumps in the Spectral Energy Distribution of Active Galactic Nuclei.** *Marcella Contini & Sueli M. Viegas.* 373, 405, 93-A9 (1991)
- Molecular Clouds in Starburst Galaxy Nuclei.** *Judith S. Young & Nicholas A. Devereux.* 373, 414, 93-B6 (1991)
- Near-Infrared Long-Slit Spectroscopy of IRAS 14348–1447.** *Tadashi Nakajima, Kimiaki Kawara, Minoru Nishida, & Brooke Gregory.* 373, 452, 93-E6 (1991)
- The Properties of X-Ray-selected Active Galactic Nuclei. I. Luminosity Function, Cosmological Evolution, and Contribution to the Diffuse X-Ray Background.** *Tommaso Maccacaro, Roberto Della Ceca, Isabella M. Gioia, Simon L. Morris, John T. Stocke, & Anna Wolter.* 374, 117, 99-D11 (1991)
- Broad Paschen-Alpha Emission in Two Extremely Infrared Luminous Seyfert 2 Galaxies.** *Dean C. Hines.* 374, L9, 103-C7 (1991)
- A Survey of the 158 Micron [C II] Fine-Structure Line in the Central 50 Parsecs of the Galaxy.** *A. Poglitsch, G. J. Stacey, N. Geis, M. Haggerty, J. Jackson, M. Rumitz, R. Genzel, & C. H. Townes.* 374, L33, 110-B5 (1991)
- Quasars and Active Galactic Nuclei in Rich Environments. I. Fields Surrounding Optically Faint Quasars.** *E. Ellingson, H. K. C. Yee, & R. F. Green.* 76, 455, 31-D2 (1991)
- Optical Polarization of a Complete Sample of Radio Sources.** *C. D. Impey, C. R. Lawrence, & S. Tapia.* 375, 46, 111-E10 (1991)
- Imaging Spectrophotometry of Ionized Gas in NGC 1068. II. Global Ionization of the Inner Disk.** *Jonathan Bland-Hawthorn, James Sokolowski, & Gerald Cecil.* 375, 78, 112-A1 (1991)
- Infrared Broad Emission Lines from an Obscured Quasar, IRAS 23060+0505.** *Tadashi Nakajima, Nathaniel P. Carleton, & Minoru Nishida.* 375, L1, 117-A7 (1991)
- Are Hypernovae Detectable?** *Seok Jae Park & Ethan T. Vishniac.* 375, 565, 119-F9 (1991)
- Line Profiles from a Disk around a Rotating Black Hole.** *Ari Laor.* 376, 90, 126-B1 (1991)
- The Einstein Observatory Extended Medium-Sensitivity Survey. II. The Optical Identifications.** *John T. Stocke, Simon L. Morris, I. M. Gioia, T. Maccacaro, R. Schild, A. Wolter, Thomas A. Fleming, & J. Patrick Henry.* 76, 813, 36-B1 (1991)
- Variable Soft X-Ray Excesses in Active Galactic Nuclei from Non-thermal Electron-Positron Pair Cascades.** *Andrzej A. Zdziarski & Paolo S. Coppi.* 376, 480, 132-D5 (1991)
- Unique Broad-Line Profile Variations in the Radio Galaxy 3C 390.3.** *Sylvain Veilleux & Wei Zheng.* 377, 89, 139-B7 (1991)
- The Featureless Continua and Hydrogen Lines of Seyfert 2 Galaxies.** *A. L. Kinney, R. R. J. Antonucci, M. J. Ward, A. S. Wilson, & M. Whittle.* 377, 100, 139-C5 (1991)
- Faint Object Spectrograph Spectroscopy of Resolved Structure in the Nucleus of NGC 1068.** *S. Caganoff, R. R. J. Antonucci, H. C. Ford, G. A. Kriss, G. Hartig, L. Armus, I. N. Evans, E. Rosenblatt, R. C. Bohlin, & A. L. Kinney.* 377, L9, 143-B11 (1991)
- Faint Object Spectrograph Observations of the Low-Luminosity Seyfert Galaxy NGC 1566.** *G. A. Kriss, G. F. Hartig, L. Armus, William P. Blair, S. Caganoff, & L. Dressel.* 377, L13, 143-C1 (1991)
- The Molecular Structure of a Starburst:  $^{13}\text{CO}$  in the Nucleus of Maffei 2.** *Robert L. Hurt & Jean L. Turner.* 377, 434, 145-B8 (1991)
- Isothermal, Compton-heated Coronae above Accretion Disks.** *Eve C. Ostriker, Christopher F. McKee, & Richard I. Klein.* 377, 593, 147-B3 (1991)
- Neutrino-heated Stars and Broad-Line Emission from Active Galactic Nuclei.** *James MacDonald, Todor Stanev, & Peter L. Biermann.* 378, 30, 151-D4 (1991)
- Multidirectional Views of the Active Nucleus of NGC 1068.** *J. S. Miller, R. W. Goodrich, & William G. Mathews.* 378, 47, 151-E13 (1991)
- The EXOSAT High Galactic Latitude Survey.** *P. Giommi, G. Tagliaferri, K. Beuermann, G. Branduardi-Raymont, R. Brissenden, U. Graser, K. O. Mason, J. D. P. Mittaz, P. Murdin, G. Pooley, H.-C. Thomas, & I. Tuohy.* 378, 77, 152-AS (1991)
- A Finger-like Extension of the 20 Kilometer per Second Cloud toward the Galactic Center.** *Sachiko K. Okumura, Masato Ishiguro, Edward B. Fomalont, Tetsuo Hasegawa, Takashi Kasuga, Koh-Ichiro Morita, Ryoei Kawabe, & Hideyuki Kobayashi.* 378, 127, 152-E9 (1991)
- A Gaseous Tail Ablated from the Supergiant IRS 7 near the Galactic Center.** *E. Serabyn, J. H. Lacy, & J. M. Achternann.* 378, 557, 159-C9 (1991)
- Echo Images of Broad-Line Regions in Active Galactic Nuclei.** *William F. Welsh & Keith Horne.* 379, 586, 172-A1 (1991)
- Modeling an Accretion Disk in NGC 985.** *R. M. Stanga, J. M. Rodriguez Espinosa, & F. Mannucci.* 379, 592, 172-A9 (1991)
- Direct Evidence for a Bar at the Galactic Center.** *Leo Blitz & David N. Spergel.* 379, 631, 172-E1 (1991)
- Location of the Thermal Continuum Source Sagittarius D.** *Dariusz C. Lis.* 379, L53, 175-B10 (1991)
- The Luminosity Function and Cosmological Evolution of X-Ray-selected BL Lacertae Objects.** *Simon L. Morris, John T. Stocke, Isabella M. Gioia, Rudy E. Schild, Anna Wolter, Tommaso Maccacaro, & Roberto Della Ceca.* 380, 49, 176-F1 (1991)
- Hybrid Accretion Disks in Active Galactic Nuclei. I. Structure and Spectra.** *Amri Wandell & Edison P. Liang.* 380, 84, 177-B1 (1991)
- Polarimetric Imaging of the Galactic Center at 12.4 Microns: The Detailed Magnetic Field Structure in the Northern Arm and East-West Bar.** *David K. Aiken, Daniel Gezari, Craig H. Smith, Mark McCaughrean, & Patrick F. Roche.* 380, 419, 183-D10 (1991)
- Millimeter Continuum Observations of Galactic Center Giant Molecular Cloud Cores.** *D. C. Lis, J. E. Carlstrom, & Jocelyn Keene.* 380, 429, 183-E7 (1991)
- A Two-Phase Model for the X-Ray Emission from Seyfert Galaxies.** *F. Haardt & L. Maraschi.* 380, L51, 188-B6 (1991)
- Infrared Hot Spots in the Nucleus of NGC 253.** *Duncan A. Forbes, Martin J. Ward, & D. L. DePoy.* 380, L63, 188-C6 (1991)
- Galactic Center Gasdynamics: A One-armed Spiral in a Keplerian Disk.** *J. H. Lacy, J. M. Achternann, & E. Serabyn.* 380, L71, 188-D6 (1991)
- Massive Black Holes in the Nuclei of Spiral Galaxies: M31 and the Problem of the Initial Conditions.** *M. Bradley, A. Curir, & F. de Felice.* 381, 72, 189-G11 (1991)
- The Starburst Ring around the Seyfert Nucleus in NGC 7469.** *A. S. Wilson, T. T. Helfer, C. A. Haniff, & M. J. Ward.* 381, 79, 190-A6 (1991)
- 3C 390.3: Modeling Variable Profile Humps.** *Wei Zheng, Sylvain Veilleux, & Steven A. Grandi.* 381, 418, 196-A1 (1991)
- Compton Backscattered 511 keV Annihilation Line Emission and the 170 keV Line from the Galactic Center Direction.** *Richard E. Lingenfelter & Xin-Min Hua.* 381, 426, 196-A10 (1991)

- A Search for the 2.223 MeV Neutron Capture Gamma-Ray Line from the Directions of Cygnus and the Galactic Center. *Michael J. Harris & Gerald H. Share.* 381, 439, 196-B10 (1991)
- The Galactic Center Radio Source Shines below the Compton Limit. *C. R. Gwinn, R. M. Danen, J. Middleditch, L. M. Ozernoy, & T. Kh. Than.* 381, L43, 199-B7 (1991)
- Infrared Spectroscopy of Cygnus A: Implications for the Obscured Active Nucleus. *Martin J. Ward, Philip R. Blanco, Andrew S. Wilson, & Minoru Nishida.* 382, 115, 201-E11 (1991)
- Fe II Emission and Anisotropy in Broad-Line Regions. *Wei Zheng & William C. Keel.* 382, 121, 201-F5 (1991)
- Polarization Properties of Emission Lines from Relativistic Accretion Disks. *Kaiyou Chen & Douglas M. Eardley.* 382, 125, 201-F10 (1991)
- A Cluster of He I Emission-Line Stars in the Galactic Center. *A. Krabbe, R. Genzel, S. Drapatz, & V. Rotaciuc.* 382, L19, 205-C1 (1991)
- The Ultraviolet Spectrum of NGC 4151 from 1978 to 1990: General Characteristics and Evolution. *M.-H. Ulrich, A. Bokserberg, G. E. Bromage, J. Clavel, A. Elvius, M. V. Penston, G. C. Perola, & M. A. J. Snijders.* 382, 483, 207-E7 (1991)
- Fanaroff-Riley I Galaxies as the Parent Population of BL Lacertae Objects. III. Radio Constraints. *C. M. Urry, P. Padovani, & M. Stickel.* 382, 501, 207-F13 (1991)
- Inference of the Extreme-Ultraviolet Continuum Shape of Quasars. *Wei Zheng.* 382, L55, 211-A11 (1991)
- The Ultraviolet Spectra of Nearby Radio Galaxies. *William C. Keel & Rogier A. Windhorst.* 383, 135, 213-F3 (1991)
- Relativistic Electron-Positron Beam Formation in the Framework of the Two-Flow Model for Active Galactic Nuclei. *Gilles Henri & Guy Pelletier.* 383, L7, 219-B1 (1991)
- Relativistic Enhancement of the Compton-reflected Component in Active Galactic Nuclei. *R. D. Rogers.* 383, 550, 221-B4 (1991)
- SIGMA Discovery of Variable  $e^+e^-$  Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7-2942. *L. Bouchet, P. Mandrou, J. P. Roques, G. Vedrenne, B. Cordier, A. Goldwurm, F. Lebrun, J. Paul, R. Sunyaev, E. Churazov, M. Gilfanov, M. Pavlinsky, S. Grebenev, G. Babalyan, I. Dekhanov, & N. Khavenson.* 383, L45, 226-C1 (1991)
- GALAXIES: PHOTOMETRY**
- The Luminosity-Diameter Relation for Disk Galaxies in Different Environments. *M. Girardi, A. Biviano, G. Giuricin, F. Mardirossian, & M. Mezzetti.* 366, 393, 7-F7 (1991)
- Stellar Population Synthesis Revisited. *Stéphane Charlot & Gustavo Bruzual.* A, 367, 126, 13-E5 (1991)
- Olbers's Paradox and the Spectral Intensity of the Extragalactic Background Light. *Paul S. Wesson.* 367, 399, 18-D5 (1991)
- High-Rate Active Galaxy Monitoring at the Wise Observatory. III. The Broad-Line Region of NGC 4151. *D. Maoz, H. Netzer, T. Mazeh, S. Beck, E. Almoznino, E. Leibowitz, N. Brosch, H. Mendelson, & A. Laor.* 367, 493, 19-E1 (1991)
- Simulated Optical Images of Galaxies at  $z \sim 1$  Using Ultraviolet Images of Nearby Galaxies. *Ralph C. Bohlin, Robert H. Cornett, Jesse K. Hill, Robert S. Hill, Wayne B. Landsman, Robert W. O'Connell, Susan G. Neff, Andrew M. Smith, & Theodore P. Stecher.* 368, 12, 23-C1 (1991)
- New Velocity Dispersions and Photometry for E and S0 Galaxies in the Great Attractor. *Alan Dressler, S. M. Faber, & David Burstein.* 368, 54, 23-G1 (1991)
- Large-Aperture BVRJK Photometry of Rich Abell Clusters: Constraints on Dark Matter. *Juan M. Uson & Stephen P. Boughn.* 369, 38, 36-D11 (1991)
- Diffuse Light in Dense Clusters of Galaxies. I. R-Band Observations of Abell 2029. *Juan M. Uson, Stephen P. Boughn, & Jeffrey R. Kuhn.* 369, 46, 36-E7 (1991)
- A Deep Imaging and Spectroscopic Survey of Faint Galaxies. *S. J. Lilly, L. L. Cowie, & J. P. Gardner.* 369, 79, 37-A1 (1991)
- Infrared Mapping of M82: A Starburst in an Edge-on Barred Galaxy. *C. M. Telesco, H. Campins, M. Joy, K. Dietz, & R. Decker.* 369, 135, 37-E11 (1991)
- A Cosmos Study of IC 1613. *Paul W. Hodge, Toby R. Smith, Paul B. Eskridge, Harvey T. MacGillivray, & Steven M. Beard.* 369, 372, 42-D5 (1991)
- The Core of the Nearby S0 Galaxy NGC 7457 Imaged with the *HST* Planetary Camera. *Tod R. Lauer, S. M. Faber, Jon A. Holtzman, William A. Baum, Douglas G. Currie, S. P. Ewald, Edward J. Groth, J. Jeff Hester, T. Kellogg, Jerome Kristian, Robert M. Light, C. Roger Lynds, Earl J. O'Neil, Jr., Edward J. Shaya, & James A. Westphal.* 369, L41, 45-E9 (1991)
- Northern Dwarf and Low Surface Brightness Galaxies. IV. The Large-Scale Space Distribution. *Trinh X. Thuan, Jean-Michel Alimi, J. Richard Gott III, & Stephen E. Schneider.* 370, 25, 47-D1 (1991)
- The Joint Far-Infrared–Optical Luminosity Function for Spiral Galaxies and Data for the Abell 400 and Cancer Clusters. *Edwige Corbelli, Edwin E. Salpeter, & John M. Dickey.* 370, 49, 47-F4 (1991)
- Weakly Barred Early-Type Ringed Galaxies. IV. The Double-ringed S0\* Galaxy NGC 7702. *R. Buta.* 370, 130, 48-F6 (1991)
- Interstellar Matter in Early-Type Galaxies. I. The Catalog. *Morton S. Roberts, David E. Hogg, Joel N. Bregman, William R. Forman, & Christine Jones.* 75, 751, 11-F5 (1991)
- The Surface Brightness Test for the Expansion of the Universe. III. Reduction of Data for the Several Brightest Galaxies in Clusters to Standard Conditions and a First Indication That the Expansion Is Real. *Allan Sandage & Jean-Marc Perelmutter.* 370, 455, 54-B1 (1991)
- Multicolor CCD Imaging of Supergiants in the Disk of NGC 253. *T. J. Davidge, O. Le Feuvre, & C. C. Clark.* 370, 559, 55-D7 (1991)
- A Near-Infrared Imaging Survey of Interacting Galaxies: The Disk-Disk Merger Candidates Subset. *S. A. Stanford & H. A. Bushouse.* 371, 92, 61-C1 (1991)
- Is the Standard Elliptical NGC 3379 a Triaxial Disk Galaxy? *M. Capaccioli, M. Vietri, E. V. Held, & H. Lorenz.* 371, 535, 68-B12 (1991)
- Faint Galaxies: Bounds on the Epoch of Galaxy Formation and the Cosmological Deceleration Parameter. *Yuzuru Yoshii & Bruce A. Peterson.* 372, 8, 74-B6 (1991)
- Optical and Near-Infrared Polarimetry of the Infrared Luminous Galaxy IRAS 23060+0505. *J. H. Hough, C. Brindle, Beverly J. Wills, D. Wills, & J. Bailey.* 372, 478, 81-F9 (1991)
- The Luminosity Distribution of Globular Clusters in Three Giant Virgo Ellipticals. *William E. Harris, J. W. B. Allwright, Christopher J. Pritchett, & Sidney van den Berg.* 76, 115, 25-D11 (1991)
- Optical Properties and Dynamics of Galaxies in the Hickson Compact Groups. *Vera C. Rubin, Deidre A. Hunter, & W. Kent Ford, Jr.* 76, 153, 26-A1 (1991)
- Triaxiality in Disk Galaxies. *F. Bertola, M. Vietri, & W. W. Zeilinger.* 374, L13, 103-D1 (1991)
- Mult wavelength Isophotal Data for Southern Elliptical Galaxies. *W. B. Sparks, J. V. Wall, P. R. Jorden, D. J. Thorne, & I. van Breda.* 76, 471, 31-F11 (1991)
- Fundamental Parameters of Brightest Cluster Galaxies. *William R. Oegerle & John G. Hoessel.* 375, 15, 111-B13 (1991)
- The Distance to the Coma Cluster Using the B-Band Tully-Fisher Relation. *M. Fukugita, S. Okamura, K. Tarusawa, H. J. Rood, & B. A. Williams.* 376, 8, 125-B9 (1991)
- Correlations between Far-Infrared, Radio, and Blue Luminosities of Spiral Galaxies. *J. J. Condon, M. L. Anderson, & G. Helou.* 376, 95, 126-B7 (1991)
- Extremely Low Surface Brightness Galaxies in the Fornax Cluster: Properties, Stability, and Luminosity Fluctuations. *Gregory D. Bothun, Christopher D. Impey, & David F. Malin.* 376, 404, 131-D10 (1991)
- Very Small Grains and the Infrared Colors of Galaxies. *G. Helou, C. Ryter, & B. T. Soifer.* 376, 505, 132-F6 (1991)
- Narrow-Band Photometry and the Evolution of Galaxies. III. The Intermediate-Redshift Sample. *Karl D. Rakos, James M. Schombert, & Tobias J. Kreidl.* 377, 382, 144-E7 (1991)
- Surface Photometry of a Sample of Elliptical and S0 Galaxies. *R. R. de Carvalho, S. Djorgovski, & L. N. da Costa.* 76, 1067, 40-E1 (1991)
- The Dark Matter Content of Spiral Galaxies. *Paolo Salucci, Keith M. Ashman, & Massimo Persic.* 379, 89, 164-B1 (1991)
- Tidally Triggered Galaxy Formation. I. Evolution of the Galaxy Luminosity Function. *Cedric Lacey & Joseph Silk.* 381, 14, 189-C1 (1991)

- Galaxy Evolution in Distant, X-Ray-Selected Clusters of Galaxies. I. Cl 1358+6245. *Daniel G. Fabricant, Jeffrey E. McClintock, & Marshall W. Bautz.* 381, 33, 189-D8 (1991)
- Systematic Bias in Cluster Galaxy Data, Affecting Galaxy Distances and Evolutionary History. *Donald H. Gudehus.* 382, 1, 200-A13 (1991)
- Optical Colors of Early-Type Galaxies in Compact Groups. *Stephen E. Zepf, Bradley C. Whitmore, & Harold F. Levison.* 383, 524, 220-G1 (1991)
- Modeling the Evolution of Galaxies in Compact Groups. *Stephen E. Zepf & Bradley C. Whitmore.* 383, 542, 221-A8 (1991)
- GALAXIES: REDSHIFTS**
- Bulk Flows, Shear, and the Great Attractor. *Nick Kaiser.* 366, 388, 7-F1 (1991)
- Coherent Peculiar Velocities and Periodic Redshifts. *Christopher T. Hill, Paul J. Steinhardt, & Michael S. Turner.* 366, L57, 11-B7 (1991)
- Lyman- $\alpha$  Companions to High- $z$  Quasars. *Esther M. Hu, Antoinette Songaila, Lennox L. Cowie, & Alan Stockton.* 368, 28, 23-D9 (1991)
- Properties of the Redshift. II. Radial Variation. *W. G. Tifft.* 368, 105, 24-D1 (1991)
- Statistical Procedure and the Significance of Periodicities in Double-Galaxy Redshifts. *W. J. Cocke & W. G. Tifft.* 368, 383, 29-G6 (1991)
- The Supergalactic Plane Redshift Survey. *Alan Dressler.* 75, 241, 4-C1 (1991)
- An Optical Catalog of Extragalactic Emission-Line Objects Similar to Quasi-stellar Objects. *A. Hewitt & G. Burbidge.* 75, 297, 5-A5 (1991)
- A Deep Imaging and Spectroscopic Survey of Faint Galaxies. *S. J. Lilly, L. L. Cowie, & J. P. Gardner.* 369, 79, 37-A1 (1991)
- Measures of Large-Scale Structure in the CfA Redshift Survey Slices. *Valérie de Lapparent, Margaret J. Geller, & John P. Huchra.* 369, 273, 41-B5 (1991)
- Discovery of a Normal Galaxy at  $z = 1.018$ . *D. J. Thompson & S. Djorgovski.* 371, L55, 73-B6 (1991)
- Southern Sky Redshift Survey: The Catalog. *L. Nicolaci da Costa, Paolo S. Pellegrini, Marc Davis, Avery Meiksin, Wallace L. W. Sargent, & John L. Tonry.* 75, 935, 15-B1 (1991)
- Faint Galaxies: Bounds on the Epoch of Galaxy Formation and the Cosmological Deceleration Parameter. *Yuzuru Yoshii & Bruce A. Peterson.* 372, 8, 74-B6 (1991)
- Peculiar Cluster Velocities from Measurements of the Kinematic Sunyaev-Zeldovich Effect. *Yoel Rephaeli & Ofer Lahav.* 372, 21, 74-C7 (1991)
- A Redshift Survey of *IRAS* Galaxies. II. Methods for Determining Self-consistent Velocity and Density Fields. *Amos Yahil, Michael A. Strauss, Marc Davis, & John P. Huchra.* 372, 380, 80-E5 (1991)
- A Redshift Survey of *IRAS* Galaxies. III. Reconstruction of the Velocity and Density Fields in *N*-Body Model Universes. *Marc Davis, Michael A. Strauss, & Amos Yahil.* 372, 394, 80-F7 (1991)
- Evidence for Structure in the Distribution of Active Galactic Nuclei with  $z < 0.05$ . *Michael J. Longo.* 372, L59, 85-B11 (1991)
- Evolution of Velocity and Density Fields around Clusters of Galaxies. *Per B. Lilje & Ofer Lahav.* 374, 29, 98-D3 (1991)
- Deep Spectroscopy under High Spatial Resolution of the High-Redshift Radio Source 3CR 368: The Monster Elucidated. *F. Hammer, O. Le Feuvre, & D. Proust.* 374, 91, 99-B7 (1991)
- A Limit on the Cosmological Constant. *R. G. Carlberg.* 375, 429, 118-B1 (1991)
- Galaxy Pairs in Redshift Catalogs as a Probe of Dark Matter. *Jane C. Charlton & Edwin E. Salpeter.* 375, 517, 119-C1 (1991)
- Dynamics of the Microwave-Decrement Cluster Abell 665. *William R. Oegerle, Michael J. Fitchett, John M. Hill, & Paul Hintzen.* 376, 46, 125-E10 (1991)
- The Evolution of Void-filled Cosmological Structures. *Enikő Regős & Margaret J. Geller.* 377, 14, 138-C1 (1991)
- Radio Source Orientation and the Angular Diameter-Redshift Relation. *L. I. Onuora.* 377, 36, 138-E1 (1991)
- The Peculiar Velocity Field in the Hercules Region. *Wolfram Freudling, Hugo Martel, & Martha P. Haynes.* 377, 349, 144-B12 (1991)
- Clusters of Galaxies Associated with Quasars. II. Galaxy Cluster Dynamics. *E. Ellingson, R. F. Green, & H. K. C. Yee.* 378, 476, 158-D1 (1991)
- Power-Spectrum Analysis of One-dimensional Redshift Surveys. *N. Kaiser & J. A. Peacock.* 379, 482, 170-F5 (1991)
- The Luminosity Function and Cosmological Evolution of X-Ray-selected BL Lacertae Objects. *Simon L. Morris, John T. Stocke, Isabella M. Gioia, Rudy E. Schild, Anna Wolter, Tommaso Maccacaro, & Roberto Della Ceca.* 380, 49, 176-F1 (1991)
- Spectroscopy of the Gravitational Arcs in Cl 2244-02, A370 (Arclet AS), and Cl 0024+1654. *Yannick Mellier, Bernard Fort, Geneviève Soucail, Guy Mathez, & Mireille Cailloux.* 380, 334, 182-D1 (1991)
- A Catalog of Absorption in the Spectra of Quasi-stellar Objects. *V. Junkkarinen, A. Hewitt, & G. Burbidge.* 77, 203, 47-B1 (1991)
- Discovery of a Low-Redshift Ultraluminous "E+A" Galaxy. *William R. Oegerle, John M. Hill, & John G. Hoessel.* 381, L9, 194-B7 (1991)
- Systematic Bias in Cluster Galaxy Data, Affecting Galaxy Distances and Evolutionary History. *Donald H. Gudehus.* 382, 1, 200-A13 (1991)
- Large-Scale Peculiar Velocity Fields in Superclusters of Galaxies. *G. Gavazzi, M. Scoggino, A. Boselli, & G. Trinchieri.* 382, 19, 200-C5 (1991)
- A Radio-quiet Galaxy at Redshift  $z = 3.409$ . *D. A. Turnshek, F. Macchetto, M. V. Bencke, C. Hazard, W. B. Sparks, & R. G. McMahon.* 382, 26, 200-D1 (1991)
- Neutral Hydrogen Observations of Galaxies in Superclusters. *M. P. Haynes & R. Giovanelli.* 77, 331, 49-B1 (1991)
- A Compilation of Redshifts and Velocity Dispersions for Abell Clusters (Epoch 1991.2). *Mitchell F. Struble & Herbert J. Rood.* 77, 363, 49-F1 (1991)
- Properties of the Redshift. III. Temporal Variation. *W. G. Tifft.* 382, 396, 206-E1 (1991)
- Bound Populations around cD Galaxies and cD Velocity Offsets in Clusters of Galaxies. *Karl Gebhardt & Timothy C. Beers.* 383, 72, 213-A1 (1991)
- The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. I. Southern Clusters. *J. R. Mould, L. Staveley-Smith, R. A. Schommer, G. D. Bothun, P. J. Hall, Ming Sheng Han, J. P. Huchra, J. Roth, W. Walsh, & A. E. Wright.* 383, 467, 220-B7 (1991)
- Effects of Internal Absorption on Galaxy Number Count and Redshift Distribution. *Boqi Wang.* 383, L37, 226-B6 (1991)
- GALAXIES: SEYFERT**
- Kinematics and Ionization of Extended Gas in Active Galaxies. VI. The Seyfert 2 Galaxy NGC 1386. *K. A. Weaver, A. S. Wilson, & J. A. Baldwin.* 366, 50, 1-F5 (1991)
- Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. I. An 8 Month Campaign of Monitoring NGC 5548 with IUE. *J. Clavel, G. A. Reichert, D. Alloin, D. M. Crenshaw, G. Kriss, J. H. Krolik, M. A. Malkan, H. Netzer, B. M. Peterson, W. Wamsteker, A. Altamore, T. Barlaud, P. Barr, S. Beck, L. Binette, G. E. Bromage, N. Brosch, A. I. Diaz, A. V. Filippenko, K. Fricke, C. M. Gaskell, P. Giommi, I. S. Glass, P. Gondhalekar, R. L. Hackney, J. P. Halpern, D. J. Hutter, S. Jörssäter, A. L. Kinney, W. Kollatschny, A. Koratkar, K. T. Korista, A. Laor, J.-P. Lasota, E. Leibowitz, D. Maoz, P. G. Martin, T. Mazeh, E. J. A. Meurs, A. D. Nair, P. O'Brien, D. Pelat, E. Perez, G. C. Perola, R. L. Ptak, P. Rodriguez-Pascual, E. I. Rosenblatt, A. C. Sadun, M. Santos-Lleo, R. A. Shaw, P. S. Smith, G. M. Stirpe, R. Stoner, W. H. Sun, M.-H. Ulrich, E. van Groningen, & W. Zheng.* 366, 64, 1-G7 (1991)
- Echo Mapping of Broad H $\beta$  Emission in NGC 5548. *Keith Home, William F. Welsh, & Bradley M. Peterson.* 367, L5, 17-B10 (1991)
- High-Rate Active Galaxy Monitoring at the Wise Observatory. III. The Broad-Line Region of NGC 4151. *D. Maoz, H. Netzer, T. Mazeh, S. Beck, E. Almoznino, E. Leibowitz, N. Brosch, H. Mendelson, & A. Laor.* 367, 493, 19-E1 (1991)
- Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths. *B. M. Peterson, T. J. Balonek, E. S. Barker, J. Bechtold, R. Bertram, N. G. Bochkarev, M. J. Bolte, D. Bond, T. A. Boroson, M. T. Carini, T. E. Carone, J. A. Christensen, S. D. Clements, A. L. Cochran, R. D. Cohen, D. Crampton, M. Dietrich, M. Elvis, A. Ferguson, A. V. Filippenko, K. J. Fricke, C. M. Gaskell, J. P. Halpern, J. P. Huchra, J. B. Hutchings, W. Kollatschny, A. P. Koratkar, K. T. Korista, J. H. Krolik, N. J. Lame, A. Laor, R. J. Leacock, G. M. MacAlpine, M. A. Malkan,*

- D. Maoz, H. R. Miller, S. L. Morris, H. Netzer, C. L. M. Oliveira, J. Penfold, M. V. Penston, E. Pérez, R. W. Pogge, M. W. Richmond, W. Romanishin, E. I. Rosenblatt, L. Saddlemeyer, A. Sadun, S. R. Sawyer, J. C. Shields, A. I. Shapovalova, A. G. Smith, H. A. Smith, P. S. Smith, W.-H. Sun, U. Thiele, T. J. Turner, S. Veilleux, R. M. Wagner, R. J. Weymann, B. J. Wilkes, B. J. Wills, D. Wills, & P. F. Younger. 368, 119, 24-E3 (1991)
- Coordinated X-Ray, Ultraviolet, and Optical Observations of 3C 120. L. Maraschi, L. Chiappetti, R. Falomo, B. Garilli, M. Malkan, G. Tagliaferri, E. G. Tanzi, & A. Treves. 368, 138, 24-F9 (1991)
- On the Size of the Broad-Line Region in Arakelian 120. Bradley M. Peterson & C. Martin Gaskell. 368, 152, 25-A1 (1991)
- The Line-emitting Regions of the Exceptional Seyfert Galaxy Markarian 359. Sylvain Veilleux. 368, 158, 25-A9 (1991)
- High-Excitation Extranuclear Gas in Seyfert Galaxies. Christopher A. Haniff, Martin J. Ward, & Andrew S. Wilson. 368, 167, 25-B5 (1991)
- An Optical Catalog of Extragalactic Emission-Line Objects Similar to Quasi-stellar Objects. A. Hewitt & G. Burbidge. 75, 297, 5-A5 (1991)
- A Study of the Structure and Kinematics of the Narrow-Line Region in Seyfert Galaxies. I. Atlas of Line Profiles. Sylvain Veilleux. 75, 357, 5-F1 (1991)
- A Study of the Structure and Kinematics of the Narrow-Line Region in Seyfert Galaxies. II. Analysis of the Line-Profile Parameters. Sylvain Veilleux. 75, 383, 6-A1 (1991)
- A Study of the Structure and Kinematics of the Narrow-Line Region in Seyfert Galaxies. III. Individual Objects. Sylvain Veilleux. 369, 331, 42-A1 (1991)
- High-Resolution Aperture Synthesis of Molecular Gas in NGC 1068. P. Planesas, N. Scoville, & S. T. Myers. 369, 364, 42-C9 (1991)
- HST Imaging of the Inner 3 Arcseconds of NGC 1068 in the Light of [O III]  $\lambda\lambda$ 5007. I. N. Evans, H. C. Ford, A. L. Kinney, R. R. J. Antonucci, L. Armus, & S. Caganoff. 369, L27, 45-C9 (1991)
- NGC 1068: Resolution of Nuclear Structure in the Optical Continuum. Roger Lynds, S. M. Faber, Edward J. Groth, Jon A. Holtzman, Robert M. Light, Earl J. O'Neil, Jr., William A. Baum, Douglas G. Currie, S. P. Ewald, J. Jeff Hester, Jerome A. Kristian, P. Kenneth Seidelmann, Edward J. Shaya, & James A. Westphal. 369, L31, 45-D1 (1991)
- The Appearance of a New Redshift System in Markarian 231. Todd A. Boroson, Karie A. Meyers, Simon L. Morris, & S. E. Person. 370, L19, 53-D1 (1991)
- An Ultraviolet Atlas of Quasar and Blazar Spectra. A. L. Kinney, R. C. Bohlin, J. C. Blades, & D. G. York. 75, 645, 10-C7 (1991)
- Structure and Kinematics of the Broad-Line Regions in Active Galaxies from IUE Variability Data. Anuradha P. Koratkar & C. Martin Gaskell. 75, 719, 11-B5 (1991)
- The Shape of the Ultraviolet Continuum of Quasars and Intergalactic Dust. F. H. Cheng, C. Martin Gaskell, & Anuradha P. Koratkar. 370, 487, 54-D9 (1991)
- The Origin of the Far-Infrared Continuum in Active Galactic Nuclei. L. K. Hunt. 370, 511, 54-F9 (1991)
- Radius-Luminosity and Mass-Luminosity Relationships for Active Galactic Nuclei. Anuradha P. Koratkar & C. Martin Gaskell. 370, L61, 59-B1 (1991)
- Near-Infrared Long-Slit Spectra of NGC 1068. M. Tamura, S. G. Kleinmann, N. Z. Scoville, & R. R. Joyce. 371, 131, 61-F3 (1991)
- C IV Line Profile Correlations in NGC 4151. R. P. Fahey, A. G. Michaelisianos, & D. Kazanas. 371, 136, 61-F9 (1991)
- The Effect of Anisotropic Emission from Thick Accretion Disks on the Luminosity Functions of Active Galactic Nuclei. C. M. Urry, P. Marziani, & M. Calvani. 371, 510, 67-G7 (1991)
- Ultraviolet Variability of NGC 5548: Dynamics of the Continuum Production Region and Geometry of the Broad-Line Region. J. H. Krolik, Keith Horne, T. R. Kallman, M. A. Malkan, R. A. Edelson, & G. A. Kriss. 371, 541, 68-C6 (1991)
- X-Ray Luminosity and Spectral Variability in the Seyfert Type I Galaxy PG 2130+099. K. P. Singh, A. R. Rao, & M. N. Vahia. 372, 49, 74-E13 (1991)
- Evidence for Structure in the Distribution of Active Galactic Nuclei with  $z < 0.05$ . Michael J. Longo. 372, L59, 85-B1 (1991)
- Hard X-Ray Variability of NGC 4151. F. Perotti, P. Maggioli, E. Quadrini, A. Bazzano, P. Ubertini, L. Bassani, J. B. Stephen, A. J. Cour, A. J. Dean, N. A. Dipper, & R. A. Lewis. 373, 75, 87-A1 (1991)
- Broad Paschen-Alpha Emission in Two Extremely Infrared Luminous Seyfert 2 Galaxies. Dean C. Hines. 374, L9, 103-C7 (1991)
- Imaging Spectrophotometry of Ionized Gas in NGC 1068. II. Global Ionization of the Inner Disk. Jonathan Bland-Hawthorn, James Sokolowski, & Gerald Cecil. 375, 78, 112-A1 (1991)
- IUE Observations of NGC 5548, 1978–1988: The Sizes and Kinematics of the Broad-Line Region. Anuradha P. Koratkar & C. Martin Gaskell. 375, 85, 112-A13 (1991)
- Imaging Spectrophotometry of Ionized Gas in NGC 1068. III. Anisotropic Excitation of the Large-Scale Disk by Scattering of Nuclear Continuum. James Sokolowski, Jonathan Bland-Hawthorn, & Gerald Cecil. 375, 583, 120-A1 (1991)
- Unique Broad-Line Profile Variations in the Radio Galaxy 3C 390.3. Sylvain Veilleux & Wei Zheng. 377, 89, 139-B7 (1991)
- The Featureless Continua and Hydrogen Lines of Seyfert 2 Galaxies. A. L. Kinney, R. R. J. Antonucci, M. J. Ward, A. S. Wilson, & M. Whittle. 377, 100, 139-C5 (1991)
- Faint Object Spectrograph Spectroscopy of Resolved Structure in the Nucleus of NGC 1068. S. Caganoff, R. R. J. Antonucci, H. C. Ford, G. A. Kriss, G. Hartig, L. Armus, I. N. Evans, E. Rosenblatt, R. C. Bohlin, & A. L. Kinney. 377, L9, 143-B11 (1991)
- Faint Object Spectrograph Observations of the Low-Luminosity Seyfert Galaxy NGC 1566. G. A. Kriss, G. F. Hartig, L. Armus, William P. Blair, S. Caganoff, & L. Dressel. 377, L13, 143-C1 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Ultraviolet Spectra of a Starburst Knot in NGC 1068. J. B. Hutchings, F. Bruhweiler, A. Boggess, S. R. Heap, D. Ebets, E. Beaver, E. Rosenblatt, K. Q. Truong, M. Perez, & R. Westmacott. 377, L25, 143-D1 (1991)
- X-Ray Observations of the Bright Seyfert Galaxy IC 4329A. K. P. Singh, A. R. Rao, & M. N. Vahia. 377, 417, 145-A1 (1991)
- Neutrino-heated Stars and Broad-Line Emission from Active Galactic Nuclei. James MacDonald, Todor Stanev, & Peter L. Biermann. 378, 30, 151-D4 (1991)
- Multidirectional Views of the Active Nucleus of NGC 1068. J. S. Miller, R. W. Goodrich, & William G. Mathews. 378, 47, 151-E13 (1991)
- Origin of Cosmic X-Ray Background Radiation. Nobuo Terasawa. 378, L11, 157-B8 (1991)
- Massive Star Formation and Superwinds in IRAS 19254–7245 (The "Superantennae"). Luis Colina, Sebastian Ltpari, & F. Macchietto. 379, 113, 164-D5 (1991)
- X-Ray Irradiation of Interstellar Grains in Active Galaxies: Evaporation and Infrared Spectra. G. Mark Voit. 379, 122, 164-E1 (1991)
- Echo Images of Broad-Line Regions in Active Galactic Nuclei. William F. Welsh & Keith Horne. 379, 586, 172-A1 (1991)
- Modeling an Accretion Disk in NGC 985. R. M. Stanga, J. M. Rodriguez Espinosa, & F. Mannucci. 379, 592, 172-A9 (1991)
- IUE Observations of NGC 1068: The Extremely Luminous Starburst Knots. F. C. Bruhweiler, K. Q. Truong, & B. Alner. 379, 596, 172-B1 (1991)
- IUE Observations of NGC 1068: The Extended High-Ionization Emission Region. K. Q. Truong & F. C. Bruhweiler. 379, 609, 172-C1 (1991)
- Search for Starbursts among X-Ray-selected Galaxies: Optical Spectroscopy. Antonella Fruscione & Richard E. Griffiths. 380, L13, 181-C1 (1991)
- X-Ray Observations of the Seyfert 1 Galaxy Markarian 464. L. Piro, G. Matt, E. Costa, D. Dal Fiume, F. Frontera, & E. Morelli. 380, 357, 182-F9 (1991)
- The Starburst Ring around the Seyfert Nucleus in NGC 7469. A. S. Wilson, T. T. Helfer, C. A. Haniff, & M. J. Ward. 381, 79, 190-A6 (1991)
- Einstein Observatory SSS and MPC Observations of the Complex X-Ray Spectra of Seyfert Galaxies. T. J. Turner, K. A. Weaver, R. E. Mushotzky, S. S. Holt, & G. M. Madejski. 381, 85, 190-B1 (1991)
- N III Line Emission in Planetary Nebulae: Not Bowen Fluorescence. S. O. Kastner & A. K. Bhatia. 381, L59, 199-D7 (1991)
- Infrared Spectroscopy of Cygnus A: Implications for the Obscured Active Nucleus. Martin J. Ward, Philip R. Blanco, Andrew S. Wilson, & Minoru Nishida. 382, 115, 201-E11 (1991)

- The Ultraviolet Spectrum of NGC 4151 from 1978 to 1990: General Characteristics and Evolution. *M.-H. Ulrich, A. Boksenberg, G. E. Bromage, J. Clavel, A. Elvius, M. V. Penston, G. C. Perola, & M. A. J. Snijders.* 382, 483, 207-E7 (1991)
- EXOSAT Observations of the Seyfert 1 Galaxy NGC 3516.* K. K. Ghosh & S. Soundararajaperumal. 383, 574, 221-D1 (1991)
- GALAXIES: STELLAR CONTENT**
- Galactic Microlensing as a Method of Detecting Massive Compact Halo Objects. *Kim Griest.* 366, 412, 8-A5 (1991)
- Stellar Population Synthesis Revisited. *Stéphane Charlot & Gustavo Bruzual.* 367, 126, 13-E5 (1991)
- Effect of a QSO on the Interstellar Medium of Its Host Galaxy. *Smita Shanbhag.* 367, 462, 19-B5 (1991)
- Metal Abundances of RR Lyrae Variables in Selected Galactic Star Fields. V. The Lick Astrographic Fields at Intermediate Galactic Latitudes. *Nicholas B. Suntzeff, T. D. Kinman, & Robert P. Kraft.* 367, 528, 19-G13 (1991)
- Star Clusters in the Clouds of Magellan. *Sidney van den Bergh.* 369, 1, 36-A11 (1991)
- Evolution of the Interstellar Medium in Elliptical Galaxies. II. X-Ray Properties. *L. P. David, W. Forman, & C. Jones.* 369, 121, 37-D9 (1991)
- A Cosmos Study of IC 1613. *Paul W. Hodge, Toby R. Smith, Paul B. Eskridge, Harvey T. MacGillivray, & Steven M. Beard.* 369, 372, 42-D5 (1991)
- Relics of an Eruptive Starburst in NGC 1569. *William H. Waller.* 370, 144, 48-G12 (1991)
- Extragalactic Globular Clusters. II. The M31 Globular Cluster System. *John P. Huchra, Jean P. Brodie, & Stephen M. Kent.* 370, 495, 54-E5 (1991)
- A Study of Star Formation in the Disks of Sa Galaxies. *Nelson Caldwell, Robert Kennicutt, Andrew C. Phillips, & Robert A. Schommer.* 370, 526, 54-G12 (1991)
- Multicolor CCD Imaging of Supergiants in the Disk of NGC 253. *T. J. Davidge, O. Le Fèvre, & C. C. Clark.* 370, 559, 55-D7 (1991)
- Near-Infrared Long-Slit Spectra of NGC 1068. *M. Tamura, S. G. Kleinmann, N. Z. Scoville, & R. R. Joyce.* 371, 131, 61-F3 (1991)
- Si IV and C IV Resonance Lines as Indicators of Massive Stars in Starburst Galaxies. *Claus Leitherer & Henny J. G. L. M. Lamers.* 373, 89, 87-B6 (1991)
- Surface Brightness Fluctuations: A Bridge from M31 to the Hubble Constant. *John L. Tonry.* 373, L1, 91-A8 (1991)
- Infrared Emission in Paired Galaxies. II. Luminosity Functions and Far-Infrared Properties. *Cong Xu & Jack W. Sulentic.* 374, 407, 104-C5 (1991)
- Wolf-Rayet Galaxies: An Introduction and a Catalog. *Peter S. Conti.* 377, 115, 139-D7 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Ultraviolet Spectra of a Starburst Knot in NGC 1068. *J. B. Hutchings, F. Bruhweiler, A. Boggess, S. R. Heap, D. Ebbets, E. Beaver, E. Rosenblatt, K. Q. Truong, M. Perez, & R. Westmacott.* 377, L25, 143-D1 (1991)
- Narrow-Band Photometry and the Evolution of Galaxies. III. The Intermediate-Redshift Sample. *Karl D. Rakos, James M. Schombert, & Tobias J. Kreidl.* 377, 382, 144-E7 (1991)
- Compact Starbursts in Ultraluminous Infrared Galaxies. *J. J. Condon, Z.-P. Huang, Q. F. Yin, & T. X. Thuan.* 378, 65, 151-G5 (1991)
- Galaxy Formation through Hierarchical Clustering. *Simon D. M. White & Carlos S. Frenk.* 379, 52, 163-F3 (1991)
- The Dark Matter Content of Spiral Galaxies. *Paolo Salucci, Keith M. Ashman, & Massimo Persic.* 379, 89, 164-B1 (1991)
- Extragalactic Globular Clusters. III. Metallicity Comparisons and Anomalies. *Jean P. Brodie & John P. Huchra.* 379, 157, 165-A1 (1991)
- Collapse of Population III Objects Induced by Cold Collisionless Dark Matter. *J. C. N. de Araujo & R. Opher.* 379, 461, 170-D10 (1991)
- A COSMOS Study of the Structure and Content of NGC 6822. *Paul Hodge, Toby Smith, Paul Eskridge, Harvey MacGillivray, & Steven Beard.* 379, 621, 172-D1 (1991)
- JHK Imaging of a Field in Baade's Window. *T. J. Davidge.* 380, 116, 177-E1 (1991)
- The Discovery of a Young Radio Galaxy at  $z = 2.390$ : Probing Initial Star Formation at  $z \lesssim 3.0$ . *Roger A. Windhorst, David Burstein,*
- Doug F. Mathis, Lyman W. Neuschafer, F. Bertola, L. M. Buson, David C. Koo, Keith Matthews, Peter D. Barthel, & K. C. Chambers. 380, 362, 182-G1 (1991)
- Population Studies. XI. The Extended Disk, Halo Configuration. *John E. Norris & Sean G. Ryan.* 380, 403, 183-C6 (1991)
- Tidally Triggered Galaxy Formation. I. Evolution of the Galaxy Luminosity Function. *Cedric Lacey & Joseph Silk.* 381, 14, 189-C1 (1991)
- Advanced Evolutionary Phases of Large-Metallicity Low-Mass Stars and the Problem of the Ultraviolet Excess of Elliptical Galaxies. *Marco Castellani & Amedeo Tornambé.* 381, 393, 195-E9 (1991)
- Detection of the Helium Flash Gap in the Integrated  $(U - B)$  versus  $(B - V)$  Diagram for 624 Large Magellanic Cloud Clusters. *E. Bica, J. J. Clariá, H. Dottori, J. F. C. Santos, Jr., & A. Piatti.* 381, L51, 199-C7 (1991)
- Wide Binaries in the Woolley Catalog. *Ira Wasserman & Martin D. Weinberg.* 382, 149, 202-A12 (1991)
- Constraints on the Origin of the Ultraviolet Upturn in Elliptical Galaxies from Hopkins Ultraviolet Telescope Observations of NGC 1399. *Henry C. Ferguson, Arthur F. Davidsen, Gerard A. Kris, William P. Blair, Charles W. Bowers, W. Van Dyke Dixon, Samuel T. Durrance, Paul D. Feldman, Richard C. Henry, Jeffrey W. Kruk, H. Warren Moos, Olaf Vancura, Knox S. Long, & Randy A. Kimble.* 382, L69, 211-C1 (1991)
- Near-Infrared [Fe II] Emission of M82 Supernova Remnants: Implications for Tracing the Supernova Content of Galaxies. *Mathew A. Greenhouse, Charles E. Woodward, Harley A. Thronson, Jr., Richard J. Rudy, George S. Rossano, Peter Erwin, & R. C. Puett.* 383, 164, 214-B1 (1991)
- Planetary Nebulae as Standard Candles. VII. A Test versus Hubble Type in the NGC 1023 Group. *Robin Ciardullo, George H. Jacoby, & William E. Harris.* 383, 487, 220-D1 (1991)
- GALAXIES: STRUCTURE**
- Hamiltonian Dynamics of Self-gravitating Ellipsoids. *G. Rosensteel & Huy Q. Tran.* 366, 30, 1-D9 (1991)
- The Physical Properties of Giant Molecular Cloud Complexes in the Outer Galaxy: Implications for the Ratio of  $H_2$  Column Density to  $^{12}\text{CO}$  Intensity. *T. J. Sodroski.* 366, 95, 2-C1 (1991)
- The Luminosity-Diameter Relation for Disk Galaxies in Different Environments. *M. Girardi, A. Biviano, G. Giuricin, F. Mardirossian, & M. Mezzetti.* 366, 393, 7-F7 (1991)
- The Star-forming Disk and CO Bar in M101. *Jeffrey D. P. Kenney, Nick Z. Scoville, & Christine D. Wilson.* 366, 432, 8-C1 (1991)
- Hollow Galactic Halos of Fermionic Dark Matter. *John P. Ralston & Lesley L. Smith.* 367, 54, 12-F4 (1991)
- On the Interpretation of the Morphology-Density Relation for Galaxies in Clusters. *Bradley C. Whitmore & Diane M. Gilmore.* 367, 64, 12-G1 (1991)
- Evidence for Environmental Effects on Early-Type Galaxy X-Ray Halos. *Raymond E. White III & Craig L. Sarazin.* 367, 476, 19-C9 (1991)
- Simulated Optical Images of Galaxies at  $z \sim 1$  Using Ultraviolet Images of Nearby Galaxies. *Ralph C. Bohlin, Robert H. Cornett, Jesse K. Hill, Robert S. Hill, Wayne B. Landsman, Robert W. O'Connell, Susan G. Neff, Andrew M. Smith, & Theodore P. Stecher.* 368, 12, 23-C1 (1991)
- Lyman- $\alpha$  Companions to High- $z$  Quasars. *Esther M. Hu, Antoinette Songaila, Lennox L. Cowie, & Alan Stockton.* 368, 28, 23-D9 (1991)
- The Universal Galaxy Rotation Curve. *Massimo Persic & Paolo Salucci.* 368, 60, 23-G9 (1991)
- A Search for Instability in Two Families of Spherical Stellar Models. *Martin D. Weinberg.* 368, 66, 24-A1 (1991)
- Extended Stellar Hydrodynamics for Galactic Disks. *Peter Amundi & Phil Cuddeford.* 368, 79, 24-B1 (1991)
- Dissipationless Collapse in an Expanding Universe. *Neal Katz.* 368, 325, 29-B4 (1991)
- Hydrodynamic Constraints on the Radial Structure of Late-Type Galaxy Disks. *Curtis Struck-Marcell.* 368, 348, 29-D5 (1991)
- Statistical-Mechanical Selection of the Shapes of Disk Galaxies. *David Montgomery & Y. C. Lee.* 368, 380, 29-G1 (1991)
- The Ring Instability in Radially Cold Oblate Galaxy Models. *Tim de Zeeuw & Martin Schwarzschild.* 369, 57, 36-F7 (1991)

- A Merger Scenario for NGC 7252: A Tale of Two Tails. *Kirk D. Borne & Douglas O. Richstone.* 369, 111, 37-C1 (1991)
- Infrared Mapping of M82: A Starburst in an Edge-on Barred Galaxy. *C. M. Telesco, H. Campins, M. Joy, K. Dietz, & R. Decher.* 369, 135, 37-E1 (1991)
- A Nonthermal Radio Halo Surrounding M82. *E. R. Sequist & Nils Odegard.* 369, 320, 41-F13 (1991)
- High-Resolution Aperture Synthesis of Molecular Gas in NGC 1068. *P. Planesas, N. Scoville, & S. T. Myers.* 369, 364, 42-C9 (1991)
- The Core of the Nearby S0 Galaxy NGC 7457 Imaged with the *HST* Planetary Camera. *Tod R. Lauer, S. M. Faber, Jon A. Holtzman, William A. Baum, Douglas G. Currie, S. P. Ewald, Edward J. Groth, J. Jeff Hester, T. Kelsall, Jerome Kristian, Robert M. Light, C. Roger Lynds, Earl J. O'Neil, Jr., Edward J. Shaya, & James A. Westphal.* 369, L41, 45-E9 (1991)
- Compression of Dark Halos by Baryon Infall: Self-similar Solutions. *Barbara S. Ryden.* 370, 15, 47-C1 (1991)
- Northern Dwarf and Low Surface Brightness Galaxies. IV. The Large-Scale Space Distribution. *Trinh X. Thuan, Jean-Michel Alimi, J. Richard Gott III, & Stephen E. Schneider.* 370, 25, 47-D1 (1991)
- Dynamical Simulations of the Interacting Galaxies in the NGC 520/UGC 957 System. *S. A. Stanford & Marc Balcells.* 370, 118, 48-E5 (1991)
- Weakly Barred Early-Type Ringed Galaxies. IV. The Double-ringed S0<sup>+</sup> Galaxy NGC 7702. *R. Buta.* 370, 130, 48-F6 (1991)
- The Effect of Inclination-dependent Selection on *IRAS* Galaxy Detection Rates. *A. J. Connolly, R. D. Joseph, & P. A. James.* 370, 140, 48-G6 (1991)
- Relics of an Eruptive Starburst in NGC 1569. *William H. Waller.* 370, 144, 48-G12 (1991)
- The Shape of the Galaxy. *Leo Blitz & David N. Spergel.* 370, 205, 49-F11 (1991)
- Fueling Starburst Galaxies with Gas-rich Mergers. *Joshua E. Barnes & Lars E. Hernquist.* 370, 365, 59-B7 (1991)
- Three-dimensional Models of a Galactic Wind Expansion with Ellipsoidal Geometry. I. The Hydrodynamical Test Case. *H. Fichtner, W. Neutsch, H. J. Fahr, & R. Schlickeiser.* 371, 98, 61-C9 (1991)
- The Infrared Properties of Compact Galactic Radio Sources: The Young and the Restless. *Richard L. White, Robert H. Becker, & David J. Helfand.* 371, 148, 62-A1 (1991)
- Ultramassive ( $\sim 10^{11} M_{\odot}$ ) Dark Core in the Luminous Infrared Galaxy NGC 6240? *Jonathan Bland-Hawthorn, Andrew S. Wilson, & R. Brent Tully.* 371, L19, 66-C7 (1991)
- Statistical Analysis of Power-Size-Redshift Distributions of Extragalactic Jets. *Alexander Rosen & Paul J. Wiita.* 371, 501, 67-F10 (1991)
- The Rate and Efficiency of High-Mass Star Formation along the Hubble Sequence. *Nicholas A. Devereux & Judith S. Young.* 371, 515, 68-A1 (1991)
- OX 169: Evidence for a Recent Merger. *Alan Stockton & Tony Farnham.* 371, 525, 68-A13 (1991)
- Is the Standard Elliptical NGC 3379 a Triaxial Disk Galaxy? *M. Capaccioli, M. Vietri, E. V. Held, & H. Lorenz.* 371, 535, 68-B12 (1991)
- Hydrodynamics of the Hot Component of the Galactic Halo. I. Steady State Solutions. *G. Einasto & A. Ferrara.* 371, 571, 68-E12 (1991)
- The Distribution and Kinematics of Neutral Gas in M31. *Robert Braun.* 372, 54, 74-F6 (1991)
- The Correlation Function of cD Clusters. *Michael J. West & Sidney van den Bergh.* 373, 1, 86-B1 (1991)
- The Far-Infrared Morphology of the Double-ringed Galaxy NGC 4736 (M94): A Ring Surrounding an Extended Nucleus. *Beverly J. Smith, D. F. Lester, P. M. Harvey, & R. W. Pogge.* 373, 66, 86-G5 (1991)
- Gaseous Halos of Elliptical Galaxies, the Cosmic Evolution of Their Radio Sizes, and the Phenomenon of Compact Steep-Spectrum Sources. *Gopal-Krishna & Paul J. Wiita.* 373, 325, 92-B1 (1991)
- H I Mapping of Galaxies in the Cluster A1367. *John M. Dickey & Giuseppe Gavazzi.* 373, 347, 92-C12 (1991)
- The Implications of Lenses for Galaxy Structure. *Christopher S. Kochanek.* 373, 354, 92-D7 (1991)
- Testing the Gravitational Field in Elliptical Galaxies: NGC 5077. *Francesco Bertola, Daniela Bettini, John Danziger, Elaine Sadler, Linda Sparke, & Tim de Zeeuw.* 373, 369, 92-E10 (1991)
- Vertical Oscillation of the Galactic Disk. *Martin D. Weinberg.* 373, 391, 92-G7 (1991)
- The 158 Micron [C II] Line: A Measure of Global Star Formation Activity in Galaxies. *G. J. Stacey, N. Geis, R. Genzel, J. B. Jugem, A. Poglitsch, A. Sternberg, & C. H. Townes.* 373, 423, 93-C1 (1991)
- Background Correlation Functions from Galaxy Rotation Curves. *Stefano Borgani, Silvio A. Bonometto, Massimo Persic, & Paolo Salucci.* 374, 20, 98-C7 (1991)
- A Catalog of Spin Orientation of Southern Galaxies. *Masanori Iye & Hajime Sugai.* 374, 112, 99-D3 (1991)
- Triaxiality in Disk Galaxies. *F. Bertola, M. Vietri, & W. W. Zeilinger.* 374, L13, 103-D1 (1991)
- Extraplanar Ionized Gas and Kinematics in the Edge-on Galaxy NGC 891. *Jean W. Keppel, Ralf-Jürgen Dettmar, John S. Gallagher III, & Morton S. Roberts.* 374, 507, 105-D6 (1991)
- Large-Scale [C II] 158 Micron Emission from the Galaxy. *Hiroshi Shibai, Haruyuki Okuda, Takao Nakagawa, Hideo Matsuhara, Toshinori Maihara, Kohei Mizutani, Yukiyasu Kobayashi, Norihisa Hirokomo, Tetsuo Nishimura, & Frank J. Low.* 374, 522, 105-F1 (1991)
- Evolution of High-Redshift Lyman-Limit Absorption Systems. *Kenneth M. Lanzetta.* 375, 1, 111-A1 (1991)
- Ram-Pressure Stripping of the Multiphase Interstellar Medium of the Virgo Cluster Elliptical Galaxy M86 (NGC 4406). *David A. White, A. C. Fabian, W. Forman, C. Jones, & C. Stern.* 375, 35, 111-D9 (1991)
- Imaging Spectrophotometry of Ionized Gas in NGC 1068. II. Global Ionization of the Inner Disk. *Jonathan Bland-Hawthorn, James Sokolowski, & Gerald Cecil.* 375, 78, 112-A1 (1991)
- What Determines the Physical Quantities of Galaxies? A Two-Component Gas Model for Protopgalaxies with Energy Input from Supernovae. *Satoru Ikeuchi & Colin A. Norman.* 375, 479, 118-F9 (1991)
- Orbital Decay in Aspherical Galaxies. II. Triaxial Systems. *Thomas S. Statler.* 375, 544, 119-E1 (1991)
- Resonance Excitation of Spiral Density Waves in a Gaseous Disk. II. A Nonlinear Theory and Application to the 3 Kiloparsec Arm. *Chi Yuan & Yu Cheng.* 376, 104, 126-C3 (1991)
- Formation of Galactic Halos from Seeded Hot Dark Matter. *Anthony van Dalen & Jens Verner Villumsen.* 376, 371, 131-B1 (1991)
- Winds, Outflows, and Inflows in X-Ray Elliptical Galaxies. I. *Luca Ciotti, Annibale D'Ercole, Silvia Pellegrini, & Alvio Renzini.* 376, 380, 131-B12 (1991)
- Extremely Low Surface Brightness Galaxies in the Fornax Cluster: Properties, Stability, and Luminosity Fluctuations. *Gregory D. Bothun, Christopher D. Impey, & David F. Malin.* 376, 404, 131-D10 (1991)
- Stability of Nonrotating Stellar Systems. II. Prolate Shell-Orbit Models. *David Merritt & Lars Hernquist.* 376, 439, 131-G13 (1991)
- Arm Classification and Velocity Gradients in Spiral Galaxies. *A. Biviano, M. Girardi, G. Giuricin, F. Mardirossian, & M. Mezzetti.* 376, 458, 132-B7 (1991)
- Galactic Disk Warps. *Konrad Kuijken.* 376, 467, 132-C4 (1991)
- CO (3-2) Mapping and Gas Excitation in the Core of M82. *R. P. J. Tilanus, L. J. Tacconi, E. C. Sutton, S. Zhou, D. B. Sanders, C. G. Wynn-Williams, K. Y. Lo, & S. A. Stephens.* 376, 500, 132-E13 (1991)
- Radio Source Orientation and the Angular Diameter-Redshift Relation. *L. I. Onuora.* 377, 36, 138-E1 (1991)
- Modes of Oscillation of a Uniformly Rotating, Homogeneous Spheroid of Stars. *Peter O. Vandervoort.* 377, 49, 138-F1 (1991)
- Neutral Hydrogen in the Outer Galaxy. *Athanassios Diplas & Blair D. Savage.* 377, 126, 139-E5 (1991)
- Infrared Emission Regions in the Interacting Galaxy System Arp 299. *C. G. Wynn-Williams, S. A. Eales, E. E. Becklin, K.-W. Hodapp, R. D. Joseph, I. S. McLean, D. A. Simons, & G. S. Wright.* 377, 426, 145-A13 (1991)
- Metallicity and Velocity Distribution of Giants toward the Galactic Poles. *Kavan U. Ratnatunga & Kenneth M. Yoss.* 377, 442, 145-C3 (1991)

- Surface Photometry of a Sample of Elliptical and S0 Galaxies. *R. R. de Carvalho, S. Djorgovski, & L. N. da Costa.* 76, 1067, 40-E1 (1991)
- The Discovery of a Long H I Plume near the Peculiar Galaxy NGC 2782 (Arp 215). *Beverly J. Smith.* 378, 39, 151-E1 (1991)
- Compact Starbursts in Ultraluminous Infrared Galaxies. *J. J. Condon, Z.-P. Huang, Q. F. Yin, & T. X. Thuan.* 378, 65, 151-G5 (1991)
- A Statistical Study of the Correlation of Galactic Supernova Remnants and Spiral Arms. *Zongwei Li, J. Craig Wheeler, Frank N. Bash, & W. H. Jefferys.* 378, 93, 152-B9 (1991)
- Topography of the Galactic Disk: Z-Structure and Large-Scale Star Formation. *Emilio J. Alfaro, Jesús Cabrera-Caño, & Antonio J. Delgado.* 378, 106, 152-C10 (1991)
- Galactic Structure from the Spacelab Infrared Telescope. II. Luminosity Models of the Milky Way. *S. M. Kent, T. M. Dame, & G. Fazio.* 378, 131, 152-F1 (1991)
- The Structure of Cold Dark Matter Halos. *John Dubinski & R. G. Carlberg.* 378, 496, 158-E11 (1991)
- Galaxy Formation through Hierarchical Clustering. *Simon D. M. White & Carlos S. Frenk.* 379, 52, 163-F3 (1991)
- A COSMOS Study of the Structure and Content of NGC 6822. *Paul Hodge, Toby Smith, Paul Eskridge, Harvey MacGillivray, & Steven Beard.* 379, 621, 172-D1 (1991)
- Direct Evidence for a Bar at the Galactic Center. *Leo Blitz & David N. Spergel.* 379, 631, 172-E1 (1991)
- NGC 4286 and NGC 3377A: Galaxies with Mixed Morphologies between the Dwarf Im and dE/DSO Types. *Allan Sandage & G. Lyle Hoffman.* 379, L45, 175-A11 (1991)
- Population Studies. X. Constraints on the Mass and Extent of the Galaxy's Dark Corona. *John E. Norris & M. R. S. Hawkins.* 380, 104, 177-C11 (1991)
- Star Formation and the Molecular Content of IC 342. *Leslie J. Sage & P. M. Solomon.* 380, 392, 183-B7 (1991)
- Population Studies. XI. The Extended Disk, Halo Configuration. *John E. Norris & Sean G. Ryan.* 380, 403, 183-C6 (1991)
- Tidally Triggered Galaxy Formation. I. Evolution of the Galaxy Luminosity Function. *Cedric Lacey & Joseph Silk.* 381, 14, 189-C1 (1991)
- Galaxy Evolution in Distant, X-Ray-Selected Clusters of Galaxies. I. Cl 1358+6245. *Daniel G. Fabricant, Jeffrey E. McClintock, & Marshall W. Bautz.* 381, 33, 189-D8 (1991)
- Orbit Crowding of Molecular Gas at a Bar-Spiral Arm Transition Zone in M83. *Jeffrey D. P. Kenney & Steven D. Lord.* 381, 118, 190-D13 (1991)
- Recent Star Formation in the Interacting Galaxy System NGC 520. *S. A. Stanford.* 381, 409, 195-G1 (1991)
- Vertical Distribution and Support of Galactic H I. *Felix J. Lockman & Curtis S. Gehman.* 382, 182, 202-D12 (1991)
- Is the Kinematically Distinct Core in NGC 5982 Necessarily the Remnant of an Accreted Companion? *Thomas S. Statler.* 382, L11, 205-B7 (1991)
- Influence of a Dark Halo on the Stability of Elliptical Galaxies. *M. Stiavelli & L. S. Sparke.* 382, 466, 207-D1 (1991)
- The Ordered Nature of Elliptical Galaxies: Implications for Their Intrinsic Angular Momenta and Shapes. *Marijn Franx, Garth Illingworth, & Tim de Zeeuw.* 383, 112, 213-D7 (1991)
- GALAXIES: THE GALAXY**
- The Physical Properties of Giant Molecular Cloud Complexes in the Outer Galaxy: Implications for the Ratio of H<sub>2</sub> Column Density to <sup>12</sup>CO Intensity. *T. J. Sodroski.* 366, 95, 2-C1 (1991)
- Abundances in H II Regions at the Edge of the Galaxy. *Michel Fich & Mariabeth Silkey.* 366, 107, 2-D1 (1991)
- VLA Radio Recombination Line Observations of Sagittarius A West. *D. A. Roberts, W. W. Goss, J. H. van Gorkom, & J. P. Leahy.* 366, L15, 6-B13 (1991)
- Reversing the Axisymmetric ( $m = 0$ ) Magnetic Fields in the Milky Way. *J. P. Vallée.* 366, 450, 8-D9 (1991)
- High-Latitude Galactic Emission and the Search for Anisotropies of the Cosmic Background Radiation. *S. Masi, P. de Bernardis, M. De Petris, M. Epifani, M. Gervasi, & G. Guarini.* 366, L51, 11-B1 (1991)
- The Galactic Disk Surface Mass Density and the Galactic Force  $K_z$  at  $z = 1.1$  Kiloparsecs. *Konrad Kuijken & Gerard Gilmore.* 367, L9, 17-C1 (1991)
- Metal Abundances of RR Lyrae Variables in Selected Galactic Star Fields. V. The Lick Astrographic Fields at Intermediate Galactic Latitudes. *Nicholas B. Suntzeff, T. D. Kinman, & Robert P. Kraft.* 367, 528, 19-G13 (1991)
- Radial Velocity Distribution and Line Strengths of 33 Carbon Stars in the Galactic Bulge. *Neil D. Tyson & R. Michael Rich.* 367, 547, 20-B6 (1991)
- The Shape of the Galaxy. *Leo Blitz & David N. Spergel.* 370, 205, 49-F11 (1991)
- Far-Infrared Line and Continuum Observations of G0.095+0.012 and the E2 Thermal Radio Filament near the Galactic Center. *Edwin F. Erickson, Sean W. J. Colgan, J. P. Simpson, Robert H. Rubin, Mark Morris, & Michael R. Haas.* 370, L69, 59-C1 (1991)
- Mapping of Infrared Helium and Hydrogen Line Profiles in the Central Few Arcseconds of the Galaxy. *T. R. Geballe, K. Krisciunas, J. A. Bailey, & R. Wade.* 370, L73, 59-C8 (1991)
- Hydrodynamics of the Hot Component of the Galactic Halo. I. Steady State Solutions. *G. Einaudi & A. Ferrara.* 371, 571, 68-E12 (1991)
- A Windswept Cometary Tail on the Galactic Center Supergiant IRS 7. *F. Yusef-Zadeh & Mark Morris.* 371, L59, 73-B10 (1991)
- Gravitational Microlensing of the Galactic Bulge Stars. *B. Paczyński.* 371, L63, 73-C4 (1991)
- Further Limits on Disklike Dark Matter from K Dwarf Kinematics. *Konrad Kuijken.* 372, 125, 75-E7 (1991)
- Line Integrals of  $n_e$  and  $n_e^2$  at High Galactic Latitude. *R. J. Reynolds.* 372, L17, 79-C1 (1991)
- Coded-Aperture Imaging of the Galactic Center Region at Gamma-Ray Energies. *Walter R. Cook, John M. Gransfeld, William A. Heindl, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone.* 372, L75, 85-D1 (1991)
- Large-Scale [C II] 158 Micron Emission from the Galaxy. *Hiroshi Shibai, Haruyuki Okuda, Takao Nakagawa, Hideo Matsuhara, Toshinori Maihara, Kohei Mizutani, Yukiyasu Kobayashi, Norihisa Hiromoto, Tetsuo Nishimura, & Frank J. Low.* 374, 522, 105-F1 (1991)
- A Survey of the 158 Micron [C II] Fine-Structure Line in the Central 50 Parsecs of the Galaxy. *A. Poglitsch, G. J. Stacey, N. Geis, M. Haggerty, J. Jackson, M. Rumitz, R. Genzel, & C. H. Townes.* 374, L33, 110-B5 (1991)
- Gravitational Microlensing by Double Stars and Planetary Systems. *Shude Mao & Bohdan Paczyński.* 374, L37, 110-B11 (1991)
- Detection of a Galactic Color Gradient for Blue Horizontal-Branch Stars of the Halo Field and Implications for the Halo Age and Density Distributions. *George W. Preston, Stephen A. Shectman, & Timothy C. Beers.* 375, 121, 112-E1 (1991)
- GRIS Observations of <sup>26</sup>Al Gamma-Ray Line Emission from Two Points in the Galactic Plane. *B. J. Teegarden, S. D. Barthelmy, N. Gehrels, J. Tueller, M. Leventhal, & C. J. MacCallum.* 375, L9, 117-B4 (1991)
- GRIS Observations of Positron Annihilation Radiation from the Galactic Center. *N. Gehrels, S. D. Barthelmy, B. J. Teegarden, J. Tueller, M. Leventhal, & C. J. MacCallum.* 375, L13, 117-B10 (1991)
- Diameters of Galactic Globular Clusters. *Sidney van den Bergh, Christopher Morley, & John Pazder.* 375, 594, 120-B1 (1991)
- Resonance Excitation of Spiral Density Waves in a Gaseous Disk. II. A Nonlinear Theory and Application to the 3 Kiloparsec Arm. *Chi Yuan & Ye Cheng.* 376, 104, 126-C3 (1991)
- Neutral Hydrogen in the Outer Galaxy. *Athanassios Diplas & Blair D. Savage.* 377, 126, 139-E5 (1991)
- Metallicity and Velocity Distribution of Giants toward the Galactic Poles. *Kavan U. Ratnatunga & Kenneth M. Yoss.* 377, 442, 145-C3 (1991)
- Topography of the Galactic Disk: Z-Structure and Large-Scale Star Formation. *Emilio J. Alfaro, Jesús Cabrera-Caño, & Antonio J. Delgado.* 378, 106, 152-C10 (1991)
- The Metallicity of RR Lyrae Stars in Baade's Window. *Alistair R. Walker & Donald M. Terndrup.* 378, 119, 152-D13 (1991)
- A Finger-like Extension of the 20 Kilometer per Second Cloud toward the Galactic Center. *Sachiko K. Okumura, Masato Ishiguro, Edward B. Fomalont, Tetsuo Hasegawa, Takashi Kasuga, Koh-Ichiro*

- Morita, Ryohei Kawabe, & Hideyuki Kobayashi.* 378, 127, 152-E9 (1991)
- Galactic Structure from the Spacelab Infrared Telescope. II. Luminosity Models of the Milky Way. *S. M. Kent, T. M. Dame, & G. Fazio.* 378, 131, 152-F1 (1991)
- A Gaseous Tail Ablated from the Supergiant IRS 7 near the Galactic Center. *E. Serabyn, J. H. Lacy, & J. M. Achtermann.* 378, 557, 159-C9 (1991)
- Direct Evidence for a Bar at the Galactic Center. *Leo Blitz & David N. Spergel.* 379, 631, 172-E1 (1991)
- Location of the Thermal Continuum Source Sagittarius D. *Dariusz C. Lis.* 379, L53, 175-B10 (1991)
- On the Distribution of the Diffuse Galactic Gamma-Ray Line Emissions at 1809 keV and 511 keV. *P. von Ballmoos.* 380, 98, 177-C1 (1991)
- Population Studies. X. Constraints on the Mass and Extent of the Galaxy's Dark Corona. *John E. Norris & M. R. S. Hawkins.* 380, 104, 177-C11 (1991)
- JHK Imaging of a Field in Baade's Window. *T. J. Davidge.* 380, 116, 177-E1 (1991)
- Population Studies. XI. The Extended Disk, Halo Configuration. *John E. Norris & Sean G. Ryan.* 380, 403, 183-C6 (1991)
- Polarimetric Imaging of the Galactic Center at 12.4 Microns: The Detailed Magnetic Field Structure in the Northern Arm and East-West Bar. *David K. Aitken, Daniel Gezari, Craig H. Smith, Mark McCaughrean, & Patrick F. Roche.* 380, 419, 183-D10 (1991)
- Millimeter Continuum Observations of Galactic Center Giant Molecular Cloud Cores. *D. C. Lis, J. E. Carlstrom, & Jocelyn Keene.* 380, 429, 183-E7 (1991)
- Galactic Center Gasdynamics: A One-armed Spiral in a Keplerian Disk. *J. H. Lacy, J. M. Achtermann, & E. Serabyn.* 380, L71, 188-D6 (1991)
- Compton Backscattered 511 keV Annihilation Line Emission and the 170 keV Line from the Galactic Center Direction. *Richard E. Lingenfelter & Xin-Min Hua.* 381, 426, 196-A10 (1991)
- A Search for the 2.223 MeV Neutron Capture Gamma-Ray Line from the Directions of Cygnus and the Galactic Center. *Michael J. Harris & Gerald H. Share.* 381, 439, 196-B10 (1991)
- The Galactic Center Radio Source Shines below the Compton Limit. *C. R. Gwinn, R. M. Danen, J. Middleditch, L. M. Ozernoy, & T. Kh. Tran.* 381, L43, 199-B7 (1991)
- H I Absorption Measurements toward 15 Pulsars and the Radial Distribution of Diffuse Ionized Gas in the Galaxy. *D. A. Frail, J. M. Cordes, T. H. Hankins, & J. M. Weisberg.* 382, 168, 202-C10 (1991)
- Vertical Distribution and Support of Galactic H I. *Felix J. Lockman & Curtis S. Gehman.* 382, 182, 202-D12 (1991)
- A Cluster of He I Emission-Line Stars in the Galactic Center. *A. Krabbe, R. Genzel, S. Drapatz, & V. Rotaciuc.* 382, L19, 205-C1 (1991)
- Cosmic Microwave Background and Galactic Quadrupoles in the Millimeter Region. *Paolo de Bernardis, Silvia Masi, & Nicola Vittorio.* 382, 515, 208-A1 (1991)
- Two Planetary Nebulae in the Direction of the Galactic Center. *A. Guiérrez-Moreno, H. Moreno, & G. Coríes.* 383, 174, 214-C1 (1991)
- Observations of Ca II Absorption along the Nearly Parallel Lines of Sight toward 3C 273 and SN 1991T. *David M. Meyer & Katherine C. Roth.* 383, L41, 226-B11 (1991)
- SIGMA Discovery of Variable  $e^+ - e^-$  Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7-2942. *L. Bouchet, P. Mandrou, J. P. Roques, G. Vedrenne, B. Cordier, A. Goldwurm, F. Lebrun, J. Paul, R. Sunyaev, E. Churazov, M. Gilfanov, M. Pavlinsky, S. Grebenev, G. Babalyan, I. Dekhanov, & N. Khavenson.* 383, L45, 226-C1 (1991)
- Three Spectral States of 1E 1740.7-2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature. *R. Sunyaev, E. Churazov, M. Gilfanov, M. Pavlinsky, S. Grebenev, G. Babalyan, I. Dekhanov, N. Khavenson, L. Bouchet, P. Mandrou, J. P. Roques, G. Vedrenne, B. Cordier, A. Goldwurm, F. Lebrun, & J. Paul.* 383, L49, 226-C6 (1991)
- GALAXIES: X-RAYS**
- Comparison of VLBI Radio-Core and X-Ray Flux Densities of Extragalactic Radio Sources. *Steven D. Bloom & Alan P. Marscher.* 366, 16, 1-C5 (1991)
- Ginga Observations of Three X-Ray-luminous Galaxies: NGC 4472, NGC 4636, and NGC 3998. *H. Awaki, K. Koyama, H. Kunieda, S. Takano, Y. Tawara, & T. Ohashi.* 366, 88, 2-B8 (1991)
- X-Ray Continuum and Evidence for an Iron Emission Line from the Quasar E1821+643. *T. Küi, O. R. Williams, T. Ohashi, H. Awaki, K. Hayashida, H. Inoue, H. Kondo, K. Koyama, F. Makino, K. Makishima, R. D. Saxon, G. C. Stewart, S. Takano, Y. Tanaka, & M. J. L. Turner.* 367, 455, 19-A11 (1991)
- Evidence for Environmental Effects on Early-Type Galaxy X-Ray Halos. *Raymond E. White III & Craig L. Sarazin.* 367, 476, 19-C9 (1991)
- Coordinated X-Ray, Ultraviolet, and Optical Observations of 3C 120. *L. Maraschi, L. Chiappetti, R. Falomo, B. Garilli, M. Malkan, G. Tagliaferri, E. G. Tanzi, & A. Treves.* 368, 138, 24-F9 (1991)
- Evolution of the Interstellar Medium in Elliptical Galaxies. II. X-Ray Properties. *L. P. David, W. Forman, & C. Jones.* 369, 121, 37-D9 (1991)
- Cooling Flows and the Formation of Massive Halos in cD Galaxies. *Andrea H. Prestwich & Marshall Joy.* 369, L1, 40-A7 (1991)
- The Number Count Distribution for X-Ray-selected BL Lacertae Objects and Constraints on the Luminosity Function. *Anna Wolter, I. M. Gioia, T. Maccacaro, S. L. Morris, & J. T. Stocke.* 369, 314, 41-F5 (1991)
- Interstellar Matter in Early-Type Galaxies. I. The Catalog. *Morton S. Roberts, David E. Hogg, Joel N. Bregman, William R. Forman, & Christine Jones.* 75, 751, 11-F5 (1991)
- X-Ray Luminosity and Spectral Variability in the Seyfert Type I Galaxy: PG 2130+099. *K. P. Singh, A. R. Rao, & M. N. Vahia.* 372, 49, 74-E13 (1991)
- A Measurement of the Mass Fluctuation Spectrum from the Cluster X-Ray Temperature Function. *J. Patrick Henry & Keith A. Arnaud.* 372, 410, 80-G11 (1991)
- Hard X-Ray Variability of NGC 4151. *F. Perotti, P. Maggioli, E. Quadrini, A. Bazzano, P. Ubertini, L. Bassani, J. B. Stephen, A. J. Court, A. J. Dean, N. A. Dipper, & R. A. Lewis.* 373, 75, 87-A1 (1991)
- The Properties of X-Ray-selected Active Galactic Nuclei. I. Luminosity Function, Cosmological Evolution, and Contribution to the Diffuse X-Ray Background. *Tommaso Maccacaro, Roberto Della Ceca, Isabella M. Gioia, Simon L. Morris, John T. Stocke, & Anna Wolter.* 374, 117, 99-D11 (1991)
- Ram-Pressure Stripping of the Multiphase Interstellar Medium of the Virgo Cluster Elliptical Galaxy M86 (NGC 4406). *David A. White, A. C. Fabian, W. Forman, C. Jones, & C. Stern.* 375, 35, 111-D9 (1991)
- Optical Coronal Emission Lines from Cooling Flows in Elliptical Galaxies and Galaxy Clusters. *Craig L. Sarazin & Christopher M. Graney.* 375, 532, 119-D3 (1991)
- The Distribution of Dark Matter in the Perseus Cluster. *C. J. Eyles, M. P. Watt, D. Bertram, M. J. Church, T. J. Ponman, G. K. Skinner, & A. P. Willmore.* 376, 23, 125-C12 (1991)
- The Einstein Observatory Extended Medium-Sensitivity Survey. II. The Optical Identifications. *John T. Stocke, Simon L. Morris, I. M. Gioia, T. Maccacaro, R. Schild, A. Wolter, Thomas A. Fleming, & J. Patrick Henry.* 76, 813, 36-B1 (1991)
- Winds, Outflows, and Inflows in X-Ray Elliptical Galaxies. I. *Luca Ciotto, Annibale D'Ercole, Silvia Pellegrini, & Alvio Renzini.* 376, 380, 131-B12 (1991)
- The X-Ray Cooling Flow in the Cluster of Galaxies around PKS 2354-35. *Daniel A. Schwartz, Hale V. Bradt, Ronald A. Remillard, & I. R. Tuohy.* 376, 424, 131-F6 (1991)
- Variable Soft X-Ray Excesses in Active Galactic Nuclei from Non-thermal Electron-Positron Pair Cascades. *Andrzej A. Zdziarski & Paolo S. Coppi.* 376, 480, 132-D5 (1991)
- X-Ray Halos as Diagnostics of Interstellar Grains. *John S. Mathis & C.-W. Lee.* 376, 490, 132-E1 (1991)
- A Model for the Spectral Variability of BL Lacertae Objects at High Frequencies. *A. Celotti, L. Maraschi, & A. Treves.* 377, 403, 144-G1 (1991)

- X-Ray Observations of the Bright Seyfert Galaxy IC 4329A.** *K. P. Singh, A. R. Rao, & M. N. Vahia.* 377, 417, 145-A1 (1991)
- The Detection of the Hot Gaseous Halo around the Small Magellanic Cloud.** *Qingde Wang.* 377, L85, 150-D1 (1991)
- An X-Ray and Radio Study of Steep-Spectrum Radio Sources. II. Four Fields from a 22 MHz Polar Cap Survey.** *P. E. Dewdney, C. H. Costain, I. McHardy, A. G. Willis, D. E. Harris, & C. P. Stern.* 76, 1055, 40-D1 (1991)
- The EXOSAT High Galactic Latitude Survey.** *P. Giommi, G. Tagliaferri, K. Beuermann, G. Branduardi-Raymont, R. Brisenden, U. Graser, K. O. Mason, J. D. P. Mittaz, P. Murdin, G. Pooley, H.-C. Thomas, & I. Tuohy.* 378, 77, 152-A5 (1991)
- X-Ray Irradiation of Interstellar Grains in Active Galaxies: Evaporation and Infrared Spectra.** *G. Mark Voit.* 379, 122, 164-E1 (1991)
- A Measurement of the Value of the Hubble Constant from the X-Ray Properties and the Sunyaev-Zel'dovich Effect of Abell 665.** *M. Birkinshaw, J. P. Hughes, & K. A. Arnaud.* 379, 466, 170-E1 (1991)
- Search for Starbursts among X-Ray-selected Galaxies: Optical Spectroscopy.** *Antonella Fruscione & Richard E. Griffiths.* 380, L13, 181-C1 (1991)
- X-Ray Observations of the Seyfert 1 Galaxy Markarian 464.** *L. Piro, G. Maior, E. Costa, D. Dal Fiume, F. Frontera, & E. Morelli.* 380, 357, 182-F9 (1991)
- X-Ray Emission from Starburst Galaxies.** *Yoel Rephaeli, Duane Gruber, Massimo Persic, & Dan MacDonald.* 380, L59, 188-C1 (1991)
- Galaxy Evolution in Distant, X-Ray-Selected Clusters of Galaxies. I. Cl 1358+6245.** *Daniel G. Fabricant, Jeffrey E. McClintock, & Marshall W. Bautz.* 381, 33, 189-D8 (1991)
- Einstein Observatory SSS and MPC Observations of the Complex X-Ray Spectra of Seyfert Galaxies.** *T. J. Turner, K. A. Weaver, R. F. Mushotzky, S. S. Holt, & G. M. Madejski.* 381, 85, 190-B1 (1991)
- A Photoionization Model for the Optical Line Emission from Cooling Flows.** *Megan Donahue & G. Mark Voit.* 381, 361, 195-C1 (1991)
- Upper Limit on Interstellar Gas in Coma Cluster Ellipticals.** *Claude R. Canizares & Paula Blizzard.* 382, 79, 201-B1 (1991)
- The Discrete X-Ray Source Population in M31.** *G. Trinchieri & G. Fabbiano.* 382, 82, 201-B6 (1991)
- Fanaroff-Riley I Galaxies as the Parent Population of BL Lacertae Objects. III. Radio Constraints.** *C. M. Urry, P. Padovani, & M. Stickel.* 382, 501, 207-F13 (1991)
- Expectations for X-Ray Cluster Observations by the ROSAT Satellite.** *A. E. Evrard & J. P. Henry.* 383, 95, 213-C1 (1991)
- Evolution of Clusters of Galaxies.** *N. Kaiser.* 383, 104, 213-C11 (1991)
- Relativistic Electron-Positron Beam Formation in the Framework of the Two-Flow Model for Active Galactic Nuclei.** *Gilles Henri & Guy Pelletier.* 383, L7, 219-B1 (1991)
- EXOSAT Observations of the Seyfert 1 Galaxy NGC 3516.** *K. K. Ghosh & S. Soundararajaperumal.* 383, 574, 221-D1 (1991)
- GAMMA RAYS: BURSTS**
- On the Nature of Soft Gamma Repeaters.** *J. P. Norris, P. Hertz, K. S. Wood, & C. Kouveliotou.* 366, 240, 4-A8 (1991)
- Flares on Mira Stars?** *Bradley E. Schaefer.* 366, L39, 6-E1 (1991)
- Bursts of Gamma Rays from Compton Scattering at Cosmological Distances.** *Andrzej A. Zdziarski, Roland Svensson, & Bohdan Paczyński.* 366, 343, 7-B3 (1991)
- Fuzzy Correlations of Gamma-Ray Bursts.** *Dieter H. Hartmann, Eric V. Linder, & George R. Blumenthal.* 367, 186, 14-D1 (1991)
- Structure of Thermal Pair Clouds around Gamma-Ray-emitting Black Holes.** *Edison P. Liang.* 367, 470, 19-C1 (1991)
- On the Transport and Acceleration of Solar Flare Particles in a Coronal Loop.** *James M. Ryan & Martin A. Lee.* 368, 316, 26-A7 (1991)
- HEAO 3 Upper Limits to Pulsed Gamma-Ray Emission from PSR 1509-58 and PSR 0833-45.** *M. P. Ulmer, W. R. Purcell, W. A. Wheaton, & W. A. Mahoney.* 369, 485, 43-F12 (1991)
- X-Ray Echoes from Gamma-Ray Bursts.** *Charles D. Dermer, Kevin C. Hurley, & Dieter H. Hartmann.* 370, 341, 51-E1 (1991)
- Synchrotron Radiation with Radiation Reaction.** *Robert W. Nelson & Ira Wasserman.* 371, 265, 63-D7 (1991)
- Magnetic Two-Photon Scattering and Two-Photon Emission: Cross Sections and Redistribution Functions.** *S. G. Alexander & P. Mészáros.* 372, 554, 82-E11 (1991)
- Cyclotron Harmonics in Accreting Pulsars and Gamma-Ray Bursts: Effect of Two-Photon Processes.** *S. G. Alexander & P. Mészáros.* 372, 565, 82-F9 (1991)
- Transverse Conductivity of a Relativistic Plasma in Oblique Electric and Magnetic Fields.** *Fulvio Melia & Marco Fatuzzo.* 373, 198, 88-D8 (1991)
- Relativistic Motion in Gamma-Ray Bursts.** *Julian H. Krolik & Edward A. Pier.* 373, 277, 89-D8 (1991)
- Coronal Proton Transport in the Presence of Alfvén Waves and Implications for Gamma-Ray Burst Models.** *D. F. Smith & S. H. Brecht.* 373, 289, 89-E9 (1991)
- Observations of Ultra-High-Energy Photons from Cygnus X-3.** *Y. Muraki, S. Shibata, T. Aoki, K. Mitsui, A. Okada, Y. Ohashi, K. Kobayakawa, H. Koijima, T. Kitamura, Y. Kato, T. Takahashi, & I. Nakamura.* 373, 657, 96-B4 (1991)
- A Slingshot Model for Solar Flares.** *Gregory Benford.* 373, 671, 96-C9 (1991)
- A Theory of Gamma-Ray Bursts Based on Resonant Compton Scattering.** *Peter Vitello & Charles D. Dermer.* 374, 668, 107-D1 (1991)
- Cyclotron Resonant Scattering and Absorption.** *Alice K. Harding & Joseph K. Daugherty.* 374, 687, 107-E8 (1991)
- Gamma-Ray Bursts from Colliding Strange Stars.** *P. Haensel, B. Paczyński, & P. Amsterdamski.* 375, 209, 113-E10 (1991)
- Transient Particle Acceleration in Strongly Magnetized Neutron Stars.** *Fulvio Melia & Marco Fatuzzo.* 376, 673, 134-F7 (1991)
- A Compton Reflection Model for the Cosmic X-Ray and Gamma-Ray Backgrounds.** *R. D. Rogers & G. B. Field.* 378, L17, 157-C1 (1991)
- A Mechanism for Gamma-Ray Bursts by Alfvén-Wave Acceleration in a Nonuniform Atmosphere.** *K. A. Holcomb & T. Tajima.* 378, 682, 160-G10 (1991)
- Very High Energy Gamma-Ray Emission from Accreting X-Ray Pulsars.** *K. S. Cheng, K. N. Yu, T. Cheung, & M. M. Lau.* 379, 290, 166-F1 (1991)
- Center-to-Limb Variations of Characteristics of Solar Flare Hard X-Ray and Gamma-Ray Emission.** *James M. McTiernan & Vahé Petrosian.* 379, 381, 167-F11 (1991)
- Neutron Star and Black Hole Binaries in the Galaxy.** *Ramesh Narayan, Tsvi Piran, & Amotz Shemi.* 379, L17, 169-B11 (1991)
- The Inability of the Resonant Compton Upscattering Model of Gamma-Ray Bursts to Produce a Third Cyclotron Harmonic.** *J. J. Brainerd.* 379, L57, 175-C1 (1991)
- X-Ray Detectability of Gamma-Ray Bursts from M31.** *Edison P. Liang.* 380, L55, 188-B11 (1991)
- The Statistics of Slow Interstellar Accretion onto Neutron Stars.** *O. Blaes & M. Rajagopal.* 381, 210, 191-E10 (1991)
- Existence of Scattering Atmospheres near Luminous, Magnetized Compact Objects.** *Charles D. Dermer & Steven J. Turner.* 382, L23, 205-C11 (1991)
- Transient Particle Acceleration in Strongly Magnetized Neutron Stars. II. Effects Due to a Dipole Field Geometry.** *Marco Fatuzzo & Fulvio Melia.* 382, 570, 208-E10 (1991)
- Neutron Star Crustal Plate Tectonics. III. Cracking, Glitches, and Gamma-Ray Bursts.** *M. Ruderman.* 382, 587, 208-G3 (1991)
- Spectral Signatures of the MeV-PeV Radiation from Accreting Neutron Stars.** *B. Rudak & P. Mészáros.* 383, 269, 215-E3 (1991)
- Gamma-Ray Bursts from Sheared Alfvén Waves.** *Fulvio Melia & Marco Fatuzzo.* 383, L57, 226-D1 (1991)
- V/V<sub>max</sub> Test Applied to Ginga Gamma-Ray Bursts.** *Y. Ogasaka, T. Murakami, J. Nishimura, A. Yoshida, & E. E. Fenimore.* 383, L61, 226-D6 (1991)
- GAMMA RAYS: GENERAL**
- Compton Scattering of Gamma Rays in Optically Thick Media.** *Magda Zbyszewska & Andrzej A. Zdziarski.* 366, 233, 3-G13 (1991)
- "Superlow-State" Hard X-Ray Observation of Cygnus X-1.** *P. Ubertini, A. Bazzano, F. Perotti, E. Quadrini, A. Courti, A. J. Dean, N. Dipper, R. Lewis, L. Bassani, & J. B. Stephen.* 366, 544, 9-G1 (1991)
- On the Observability of the Gamma-Ray Line Flux from Dark Matter Annihilation.** *S. Rudaz & F. W. Stecker.* 368, 406, 30-B5 (1991)

- Gamma-Ray Lines from Type I Supernovae. *K. W. Chan & R. E. Lingenfelter.* 368, 515, 31-E1 (1991)
- No Evidence for TeV Gamma Radiation from 2CG 006-00. *H. J. Nel, B. C. Raubenheimer, O. C. de Jager, R. Buccieri, M. Busetta, A. R. North, & C. Brink.* 368, 585, 32-D4 (1991)
- Possible Detection of TeV Gamma Rays from AM Herculis. *C. L. Bhat, R. K. Kaul, H. S. Rawat, V. K. Seneca, R. C. Rannat, M. L. Sapru, A. K. Tickoo, & H. Razdan.* 369, 475, 43-E12 (1991)
- Phase Coherence for TeV/PeV Binary Sources. *D. A. Lewis, R. C. Lamb, & S. D. Biller.* 369, 479, 43-F4 (1991)
- Problems of Ultra-High-Energy Particle Acceleration in Cygnus X-3: A Critical Reappraisal. *Abbas Mitra.* 370, 345, 51-E7 (1991)
- Comptonization of Gamma Rays by Cold Electrons. *Yueming Xu, Randy R. Ross, & Richard McCray.* 371, 280, 63-E11 (1991)
- Cosmic Rays from Primordial Black Holes. *Jane H. MacGibbon & B. J. Carr.* 371, 447, 67-B5 (1991)
- Solar Abundances from Gamma-Ray Spectroscopy: Comparisons with Energetic Particle, Photospheric, and Coronal Abundances. *R. J. Murphy, R. Ramay, B. Kozlovsky, & D. V. Reames.* 371, 793, 71-D6 (1991)
- Coded-Aperture Imaging of the Galactic Center Region at Gamma-Ray Energies. *Walter R. Cook, John M. Grunsfeld, William A. Heindl, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone.* 372, L75, 85-D1 (1991)
- Stationary Accelerators around Keplerian Disks of Aligned Magnetized Collapsed Objects: Pair Production and Gamma-Ray Emission. *K. S. Cheng & M. Ruderman.* 373, 187, 88-C9 (1991)
- Cosmic-Ray Distribution and the Dynamic Balance in the Large Magellanic Cloud. *Carl E. Fichtel, Mehmet E. Özel, Robert G. Stone, & P. Sreekumar.* 374, 134, 99-F7 (1991)
- Determination of Confidence Limits for Experiments with Low Numbers of Counts. *Ralph P. Kraft, David N. Burrows, & John A. Nousek.* 374, 344, 102-D1 (1991)
- Search for Diffuse Cosmic Gamma Rays above 200 TeV. *J. Matthews, D. Ciampa, K. D. Green, J. Kolodziejczak, D. Nitz, D. Sinclair, G. Thornton, J. C. van der Velde, G. L. Cassiday, R. Cooper, S. C. Corbato, B. R. Dawson, J. W. Elbert, B. E. Fick, D. B. Kieda, S. Ko, D. F. Liebing, E. C. Loh, M. H. Salamon, J. D. Smith, P. Sokolsky, S. B. Thomas, & B. Wheeler.* 375, 202, 113-E1 (1991)
- A Search for the 478 keV Line from the Decay of Nucleosynthetic  $^7\text{Be}$ . *Michael J. Harris, Mark D. Leising, & Gerald H. Share.* 375, 216, 113-F5 (1991)
- Bremsstrahlung and Energetic Electrons in Supernovae. *Donald D. Clayton & Li-Sin The.* 375, 221, 113-F12 (1991)
- GRIS Observations of  $^{26}\text{Al}$  Gamma-Ray Line Emission from Two Points in the Galactic Plane. *B. J. Teegarden, S. D. Barthelmy, N. Gehrels, J. Tueller, M. Leventhal, & C. J. MacCallum.* 375, L9, 117-B4 (1991)
- GRIS Observations of Positron Annihilation Radiation from the Galactic Center. *N. Gehrels, S. D. Barthelmy, B. J. Teegarden, J. Tueller, M. Leventhal, & C. J. MacCallum.* 375, L13, 117-B10 (1991)
- Detection of a Feature at 0.44 MeV in the Crab Pulsar Spectrum with FIGARO II: A Redshifted Positron Annihilation Line? *E. Massaro, G. Matt, M. Salvati, E. Costa, P. Mandrou, M. Niel, J. F. Olive, T. Mineo, B. Sacco, L. Scarsi, G. Gerard, B. Agrinier, E. Barouch, R. Comte, B. Parlier, & J. L. Masnou.* 376, L11, 130-B7 (1991)
- Transient Particle Acceleration in Strongly Magnetized Neutron Stars. *Fulvio Melia & Marco Fatuzzo.* 376, 673, 134-F7 (1991)
- Search for TeV Emission from 4U 0115+63. *D. J. Macomb, M. F. Cawley, D. J. Fegan, A. M. Hillas, P. W. Kwok, R. C. Lamb, M. J. Lang, D. A. Lewis, P. T. Reynolds, G. Vacanti, & T. C. Weekes.* 376, 738, 135-D12 (1991)
- Gamma-Ray Observations of the Crab Nebula at TeV Energies. *G. Vacanti, M. F. Cawley, E. Colombo, D. J. Fegan, A. M. Hillas, P. W. Kwok, M. J. Lang, R. C. Lamb, D. A. Lewis, D. J. Macomb, K. S. O'Flaherty, P. T. Reynolds, & T. C. Weekes.* 377, 467, 145-E4 (1991)
- Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy. *C. W. Akerlof, M. F. Cawley, M. Chantell, D. J. Fegan, K. Harris, A. M. Hillas, D. G. Jennings, R. C. Lamb, M. A. Lawrence, M. J. Lang, D. A. Lewis, D. I. Meyer, G. Mohanty, K. S. O'Flaherty, M. Punch, P. T. Reynolds, M. S. Schubnell, T. C. Weekes, & T. Whitaker.* 377, L97, 150-E6 (1991)
- Cosmic-Ray Transport and Gamma-Ray Emission in Supernova Shells. *A. K. Harding, A. Mastichiadis, R. J. Protheroe, & A. P. Szabo.* 378, 163, 153-A9 (1991)
- Positron Annihilation in the Interstellar Medium. *Nidhal Guessoum, Reuven Ramaty, & Richard E. Lingenfelter.* 378, 170, 153-B4 (1991)
- SN 1991T: Gamma-Ray Observatory's First Supernova? *Adam Burrows, Anurag Shankar, & Kenneth A. Van Riper.* 379, L7, 169-B1 (1991)
- A Model of Unpulsed Very High Energy Gamma Rays from the Crab Nebula and Pulsar. *P. W. Kwok, K. S. Cheng, & M. M. Lau.* 379, 653, 172-G1 (1991)
- Solar Gamma-Ray-Line Flares, Type II Radio Bursts, and Coronal Mass Ejections. *E. W. Cliver, H. V. Cane, D. J. Forrest, M. J. Koonen, R. A. Howard, & C. S. Wright.* 379, 741, 174-A2 (1991)
- "Hidden" Millisecond Pulsars. *Marco Tavani.* 379, L69, 175-D5 (1991)
- On the Distribution of the Diffuse Galactic Gamma-Ray Line Emissions at 1809 keV and 511 keV. *P. von Ballmoos.* 380, 98, 177-C1 (1991)
- Search for High-Energy Neutrinos from Celestial Sources in the Kolar Gold Fields Experiment. *H. Adarkar, S. R. Dugad, Y. Hayashi, N. Ito, S. Kawakami, M. R. Krishnaswamy, M. G. K. Menon, S. Miyake, N. K. Mondal, T. Nakamura, V. S. Narasimham, B. V. Sreekantan, & K. Tanaka.* 380, 235, 179-A1 (1991)
- A Model of Pulsed Gamma Radiation from the X-Ray Binary Hercules X-1/Herculis. *F. A. Aharonian & A. M. Atoyan.* 381, 220, 191-F3 (1991)
- Compton Backscattered 511 keV Annihilation Line Emission and the 170 keV Line from the Galactic Center Direction. *Richard E. Lingenfelter & Xin-Min Hua.* 381, 426, 196-A10 (1991)
- A Search for the 2.223 MeV Neutron Capture Gamma-Ray Line from the Directions of Cygnus and the Galactic Center. *Michael J. Harris & Gerald H. Share.* 381, 439, 196-B10 (1991)
- Capture Rate of the  $^7\text{Li}(n, \gamma)^8\text{Li}$  Reaction by Prompt Gamma-Ray Detection. *Y. Nagai, M. Igashira, N. Mukai, T. Ohsaki, F. Uesawa, K. Takada, T. Ando, H. Kitazawa, S. Kubono, & T. Fukuda.* 381, 444, 196-C1 (1991)
- Inverse-Compton Gamma-Ray Emission from Chaotic, Early-Type Stellar Winds and Its Detectability by *Gamma Ray Observatory*. *Wan Chen & Richard L. White.* 381, L63, 199-E1 (1991)
- Transient Particle Acceleration in Strongly Magnetized Neutron Stars. II. Effects Due to a Dipole Field Geometry. *Marco Fatuzzo & Fulvio Melia.* 382, 570, 208-E10 (1991)
- Search for TeV Gamma-Ray Emission from Hercules X-1. *P. T. Reynolds, M. F. Cawley, D. J. Fegan, A. M. Hillas, P. W. Kwok, R. C. Lamb, M. J. Lang, D. A. Lewis, D. J. Macomb, K. S. O'Flaherty, G. Vacanti, & T. C. Weekes.* 382, 640, 209-E7 (1991)
- Simultaneous Correlation Analysis of Combined Gamma-Ray Data. *K. N. Yu.* 382, 647, 209-F1 (1991)
- Signatures of Cosmic-Ray Interactions on the Solar Surface. *D. Seckel, Todor Stanev, & T. K. Gaisser.* 382, 652, 209-F8 (1991)
- Low-Flux Hard X-Ray Observation of Cygnus X-1. *P. Ubertini, A. Bazzano, C. La Padula, R. K. Manchanda, V. F. Polcaro, R. Stauber, E. Kendziorra, & F. Perotti.* 383, 263, 215-D9 (1991)
- SIGMA Discovery of Variable  $e^+e^-$  Annihilation Radiation from the Near Galactic Center Variable Compact Source 1E 1740.7-2942. *L. Bouchet, P. Mandrou, J. P. Roques, G. Vedrenne, B. Cordier, A. Goldwurm, F. Lebrun, J. Paul, R. Sunyaev, E. Churazov, M. Gilfanov, M. Pavlinsky, S. Grebenev, G. Babalyan, I. Dekhanov, & N. Khavenson.* 383, L45, 226-C1 (1991)
- Three Spectral States of 1E 1740.7-2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature. *R. Sunyaev, E. Churazov, M. Gilfanov, M. Pavlinsky, S. Grebenev, G. Babalyan, I. Dekhanov, N. Khavenson, L. Bouchet, P. Mandrou, J. P. Roques, G. Vedrenne, B. Cordier, A. Goldwurm, F. Lebrun, & J. Paul.* 383, L49, 226-C6 (1991)
- A Search of the Northern Sky for Ultra-High-Energy Point Sources. *D. E. Andreas, D. Berley, S. Biller, R. L. Burman, D. R. Cady, C. Y. Chang, B. L. Dingus, C. L. Dion, G. M. Dion, R. W. Ellsworth, S. J. Freedman, B. K. Fujikawa, J. A. Goodman, T. J. Haines, C. M. Hoffman, D. A. Krakauer, P. W. Kwok, X-Q Lu, D. E. Nagle,*

- M. Potter, V. D. Sandberg, C. Sinnis, M. J. Stark, P. R. Vishwanath, G. B. Yodh, & W. P. Zhang.* 383, L53, 226-C11 (1991)
- Gamma-Ray Bursts from Sheared Alfvén Waves.** *Fulvio Melia & Marco Fatuzzo.* 383, L57, 226-D1 (1991)
- GRAVITATION**
- On the [O/Fe] versus [Fe/H] Relationship and the Progenitors of Type I Supernovae. *C. Abia, R. Canal, & J. Isern.* 366, 198, 3-E1 (1991)
- On the Orbital Period Change of the Binary Pulsar PSR 1913+16. *Thibault Damour & J. H. Taylor.* 366, 501, 9-C1 (1991)
- Criticism of Lake's Analysis of the Rotation Curves of Dwarf Spirals. *Mordehai Milgrom.* 367, 490, 19-D11 (1991)
- Constraints on Weyl Gravity on Subgalactic Distance Scales. *Kent S. Wood & Robert J. Nemiroff.* 369, 54, 36-F3 (1991)
- Gravity in One Dimension: A Correction for Ensemble Averaging. *Charles J. Reidl, Jr., & Bruce N. Miller.* 371, 260, 63-D1 (1991)
- White Dwarf and Neutron Star Interior Solutions in the Nonsymmetric Gravitational Theory. *L. M. Campbell, J. W. Moffat, & P. Savaria.* 372, 241, 77-A1 (1991)
- Gravitational Clustering in the Expanding Universe: Controlled High-Resolution Studies in Two Dimensions. *John Francis Beacom, Kurt G. Dominik, Adrian L. Melott, Sam P. Perkins, & Sergei F. Shandarin.* 372, 351, 80-B7 (1991)
- Coincidence Probabilities for Spacecraft Gravitational Wave Experiments: Massive Coalescing Binaries. *Massimo Tinto & J. W. Armstrong.* 372, 545, 82-E1 (1991)
- Voyager 2* Test of the Radar Time-Delay Effect. *Timothy P. Krisher, John D. Anderson, & Anthony H. Taylor.* 373, 665, 96-C1 (1991)
- General Structure of the Gravitational Equations of Motion in Conformal Weyl Gravity. *Demosthenes Kazanas & Philip D. Mannheim.* 76, 431, 31-B1 (1991)
- Perturbations of the Robertson-Walker Space: Multicomponent Sources and Generalized Gravity. *Jai-chan Hwang.* 375, 443, 118-C7 (1991)
- Gravitational Redshift Determinations for White Dwarfs in Common Proper-Motion Binaries. *Gary Wegner & I. Neill Reid.* 375, 674, 121-B1 (1991)
- Gravitational Redshift for the Pleiad White Dwarf LB 1497. *Gary Wegner, I. Neill Reid, & Robert K. McMahan, Jr.* 376, 186, 127-C6 (1991)
- Solar Gravitational Redshift from the Infrared Oxygen Triplet. *James C. LoPresto, Charles Schrader, & A. Keith Pierce.* 376, 757, 135-F11 (1991)
- A New Gravitational Interaction of Cosmological Importance. *David F. Crawford.* 377, 1, 138-B1 (1991)
- Li Depletion in F Stars by Internal Gravity Waves. *Ramón J. García López & Hendrik C. Spruit.* 377, 268, 141-C7 (1991)
- Fluctuations of the Microwave Background Radiation on Large and Intermediate Angular Scales. *F. Atrio-Barandela, A. G. Doroshkevich, & A. A. Klypin.* 378, 1, 151-A11 (1991)
- Neutron Star and Black Hole Binaries in the Galaxy. *Ramesh Narayan, Tsvi Piran, & Amotz Shemi.* 379, L17, 169-B11 (1991)
- The Rate of Neutron Star Binary Mergers in the Universe: Minimal Predictions for Gravity Wave Detectors. *E. S. Phinney.* 380, L17, 181-C6 (1991)
- The Scale Dependence of Galaxy Distribution Functions. *William C. Saslaw & Philippe Crane.* 380, 315, 182-C1 (1991)
- The Secular Instability of Axisymmetric Collisionless Star Clusters. *Henry E. Kandrup.* 380, 511, 184-E9 (1991)
- Gravitational Radiation from Dual Neutron Star Elliptical Binaries. *Dieter Hils.* 381, 484, 196-F5 (1991)
- Gravitational Effects of Light Scalar Particles. *Thomas Helbig.* 382, 223, 203-A7 (1991)
- Precollapse Scale Invariance in Gravitational Instability. *F. Moutarde, J.-M. Alimi, F. R. Bouchet, R. Pellat, & A. Ramani.* 382, 377, 206-C5 (1991)
- Microwave Background Anisotropies Implied by Large-Scale Galaxy Correlations: The Minimum of  $C(0)$  and Cosmological Parameters. *A. Kashlinsky.* 383, L1, 219-A7 (1991)
- GRAVITATIONAL LENSES**
- Cosmic X-Ray Background from Hot Gas. *R. D. Rogers & G. B. Field.* 366, 22, 1-C13 (1991)
- A Straight Gravitational Image in Abell 2390: A Striking Case of Lensing by a Cluster of Galaxies. *Roser Pelló, Jean-François Le Borgne, Geneviève Soucail, Yannick Mellier, & Blai Sanahuja.* 366, 405, 7-G9 (1991)
- Galactic Microlensing as a Method of Detecting Massive Compact Halo Objects. *Kim Griest.* 366, 412, 8-A5 (1991)
- A Technique for Using Radio Jets as Extended Gravitational Lensing Probes. *Philipp P. Kronberg, Charles C. Dyer, E. Margaret Burbidge, & Vesa T. Junkkarinen.* 367, L1, 17-B1 (1991)
- First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305. *P. Crane, R. Albrecht, C. Barbieri, J. C. Blades, A. Bokkenberg, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kamperman, I. R. King, F. Macchetto, C. D. Mackay, F. Paresce, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, & W. B. Sparks.* 369, L59, 46-A7 (1991)
- Gravitational Lensing by Clusters of Galaxies: Constraining the Mass Distribution. *Jordi Miralda-Escudé.* 370, 1, 47-B1 (1991)
- Correlation Function of Gravitational Deflection Angles of Light Paths. *Kazuya Watanabe & Kenji Tomita.* 370, 481, 54-D1 (1991)
- Gravitational Microlensing of the Galactic Bulge Stars. *B. Paczyński.* 371, L63, 73-C4 (1991)
- New Model for the 0957+561 Gravitational Lens System: Bounds on Masses of a Possible Black Hole and Dark Matter and Prospects for Estimation of  $H_0$ . *E. E. Falco, M. V. Gorenstein, & I. I. Shapiro.* 372, 364, 80-D1 (1991)
- Gravitational Microlensing as a Method of Detecting Disk Dark Matter and Faint Disk Stars. *Kim Griest, Charles Alcock, Timothy S. Axelrod, David P. Bennett, Kem H. Cook, Kenneth C. Freeman, Hye-Sook Park, Saul Perlmutter, Bruce A. Peterson, Peter J. Quinn, Alexander W. Rodgers, & Christopher W. Stubbs (The MACHO Collaboration).* 372, L79, 85-D5 (1991)
- The Implications of Lenses for Galaxy Structure. *Christopher S. Kochanek.* 373, 354, 92-D7 (1991)
- Gravitational Microlensing of High-Redshift Supernovas by Compact Objects. *Kevin P. Rauch.* 374, 83, 99-A11 (1991)
- Gravitational Lens Interference. *J. B. Peterson & Toby Falk.* 374, L5, 103-C1 (1991)
- The Complete Sample of 1 Jansky BL Lacertae Objects. I. Summary Properties. *M. Stickel, P. Padovani, C. M. Urry, J. W. Fried, & H. Kühr.* 374, 431, 104-E1 (1991)
- Gravitational Microlensing by Double Stars and Planetary Systems. *Shude Mao & Bohdan Paczyński.* 374, L37, 110-B11 (1991)
- Formation and Distortion of Optical Rings around Rich Cluster Galaxies. *Christopher S. Kochanek & Roger D. Blandford.* 375, 492, 118-G11 (1991)
- Gravitational Lensing and the Lyman-Alpha Forest. *Satoru Ikeuchi & Edwin L. Turner.* 375, 499, 119-A5 (1991)
- Evidence for a Massive, Dark Gravitational Lensing Object in Q2345+007. *Robert C. Duncan.* 375, L41, 124-B1 (1991)
- Bounds on the Enhancement of Quasar Counts by Lenses. *Israel Kovner.* 376, 70, 125-G8 (1991)
- Infrared and Visible Photometry of the Gravitational Lens System 2237+030. *Daniel Nadeau, H. K. C. Yee, W. J. Forrest, J. D. Garnett, Z. Ninkov, & J. L. Pipkin.* 376, 430, 131-G1 (1991)
- A New Approach to Gravitational Microlensing: Time Delays and the Galactic Mass Distribution. *Lawrence M. Krauss & Todd A. Small.* 378, 22, 151-C8 (1991)
- Gravitational Lensing, Time Delay, and Angular Diameter Distance. *Ramesh Narayan.* 378, L5, 157-B1 (1991)
- First- and Second-Epoch VLBI Observations of the Gravitational Lens System 2016+112. *M. B. Heflin, M. V. Gorenstein, C. R. Lawrence, & B. F. Burke.* 378, 519, 158-G9 (1991)
- The Magnification of Stars Crossing a Caustic. I. Lenses with Smooth Potentials. *Jordi Miralda-Escudé.* 379, 94, 164-B7 (1991)
- Selection Effects in Optical Surveys for Gravitational Lenses. *Christopher S. Kochanek.* 379, 517, 171-B1 (1991)
- The Correlation Function of Galaxy Ellipticities Produced by Gravitational Lensing. *Jordi Miralda-Escudé.* 380, 1, 176-B1 (1991)
- Statistics of Gravitational Lenses: The Uncertainties. *Shude Mao.* 380, 9, 176-B9 (1991)

- Spectroscopy of the Gravitational Arcs in Cl 2244–02, A370 (Arclet A5), and Cl 0024+1654. *Yannick Mellier, Bernard Fort, Geneviève Soucail, Guy Mathez, & Mireille Cailloux.* 380, 334, 182–D10 (1991)
- Bounds on Intergalactic Compact Objects from Observations of Compact Radio Sources. *Aggeliki Kassiola, Israel Kovner, & Roger D. Blandford.* 381, 6, 189–B4 (1991)
- Spatially Resolved Spectroscopy of Lyman-Alpha and C IV in the Gravitational Lens 2237+030. *H. K. C. Yee & M. M. De Robertis.* 381, 386, 195–E1 (1991)
- Microlensing and the Structure of Active Galactic Nucleus Accretion Disks. *Kevin P. Rauch & Roger D. Blandford.* 381, L39, 199–B1 (1991)
- Systematic Effects in Lens Inversions: R<sub>1</sub> Exact Models for 0957+561. *Christopher S. Kochanek.* 382, 58, 200–G1 (1991)
- Are Quasar Redshifts Cosmological? *Arnon Dar.* 382, L1, 205–A7 (1991)
- Thin and Giant Luminous Arcs: A Strong Test of the Lensing Cluster Mass Distribution. *F. Hammer.* 383, 66, 212–G8 (1991)
- HIGH-LATITUDE OBJECTS**
- CO J = 3 → 2 Observations of Translucent and High-Latitude Molecular Clouds. *Ewine F. van Dishoeck, John H. Black, T. G. Phillips, & R. Grebel.* 366, 141, 2–G1 (1991)
- IUE Observations of Early-Type Stars at High Galactic Latitudes. *D. A. Quin, P. J. F. Brown, E. S. Conlon, P. L. Dufton, & F. P. Keenan.* 375, 342, 115–B7 (1991)
- An Infrared/Optical Investigation of 100 Micron “Cirrus.” *Elizabeth S. Paley, Frank J. Low, John T. McGraw, Roc M. Cutri, & Hans-Walter Rix.* 376, 335, 129–A13 (1991)
- Metallicity and Velocity Distribution of Giants toward the Galactic Poles. *Kavan U. Ratnatunga & Kenneth M. Yoss.* 377, 442, 145–C3 (1991)
- HYDRODYNAMICS**
- Nonaxisymmetric Instabilities in Rotating Shear Flows: Internal Gravity Modes in Stratified Media and Analogies with Plane Flows. *P. Ghosh & M. A. Abramowicz.* 366, 221, 3–F13 (1991)
- Coronal Loop Heating by Wave-Particle Interactions. *Altair S. de Assis & King H. Thui.* 366, 324, 5–B1 (1991)
- Instabilities and Clumping in SN 1987A. I. Early Evolution in Two Dimensions. *Bruce Fryxell, Ewald Müller, & David Arnett.* 367, 619, 21–A5 (1991)
- Hydrodynamic Constraints on the Radial Structure of Late-Type Galaxy Disks. *Curtis Struck-Marcell.* 368, 348, 29–D5 (1991)
- The Dynamic Instability of Adiabatic Blast Waves. *Dongsu Ryu & Ethan T. Vishniac.* 368, 411, 30–B12 (1991)
- The Effect of Viscosity on Steady Transonic Flow with a Nodal Solution Topology. *S. P. Owocki & G. P. Zank.* 368, 491, 31–C1 (1991)
- Rayleigh-Taylor Instabilities and Mixing in the Helium Star Models for Type Ib/Ic Supernovae. *Izumi Hachisu, Takuya Matsuda, Ken'ichi Nomoto, & Toshikazu Shigeyama.* 368, L27, 35–B4 (1991)
- Star Formation and the Nature of Bipolar Outflows. *Frank H. Shu, Steven P. Ruden, Charles J. Lada, & Susana Lizano.* 370, L31, 53–E1 (1991)
- Two-Temperature Accretion Disks with Winds in a Fluid Approximation. *Masaaki Kusunose.* 370, 505, 54–F1 (1991)
- A Polytropic Model of an Accretion Disk, a Boundary Layer, and a Star. *Bohdan Paczyński.* 370, 597, 55–G11 (1991)
- On the Thermal Stability of Slabs, Cylinders, and Spheres. *Miguel H. Ibáñez S., & Florencio P. Plachco M.* 370, 743, 57–F1 (1991)
- Hydrodynamical Instabilities and Mixing in SN 1987A: Two-dimensional Simulations of the First 3 Months. *Marc Herant & Willy Benz.* 370, L81, 59–D6 (1991)
- The Deflection of Cosmic Jets. *David S. De Young.* 371, 69, 61–A1 (1991)
- Ambipolar Diffusion, Cloud Cores, and Star Formation: Two-dimensional, Cylindrically Symmetric Contraction. I. The Issues, Formulation of the Problem, and Method of Solution. *Telemachos Ch. Mouschovias & Scott A. Morton.* 371, 296, 63–G1 (1991)
- Enhanced Winds and Tidal Streams in Massive X-Ray Binaries. *John M. Blondin, Ian R. Stevens, & Timothy R. Kallman.* 371, 684, 70–B1 (1991)
- Accretion in Wind-driven X-Ray Sources. *Ronald E. Taam, Albert Fu, & B. A. Fryxell.* 371, 696, 70–C1 (1991)
- Near-critical Spherical Accretion by Neutron Stars: General Relativistic Treatment. *Myeong-Gu Park & Guy S. Miller.* 371, 708, 70–D1 (1991)
- On Magnetothermal Instability in Cluster Cooling Flows. *Steven A. Balbus.* 372, 25, 74–C13 (1991)
- Supernova Remnant 1987A. *Ding Luo & Richard McCray.* 372, 194, 76–D1 (1991)
- Nonlinear Evolution of Accretion Disks Induced by Radiative Feedback Processes. *K. R. Bell, D. N. C. Lin, & Steven P. Ruden.* 372, 633, 83–E7 (1991)
- The Oscillations of Rapidly Rotating Newtonian Stellar Models. II. Dissipative Effects. *James R. Ipser & Lee Lindblom.* 373, 213, 88–E12 (1991)
- Mechanics and Energetics of Vortex Unpinning in Neutron Stars. *Bennett K. Link & Richard I. Epstein.* 373, 592, 95–C11 (1991)
- The Hydrodynamics of Relict Cosmological H II Regions and the Formation of Objects at High Redshift. *Piero Madau & Avery Meiksin.* 374, 6, 98–B7 (1991)
- Model Light Curves of Linear Type II Supernovae. *Douglas A. Swartz, J. Craig Wheeler, & Robert P. Harkness.* 374, 266, 101–D7 (1991)
- The Collapse of Cylindrical Isothermal and Polytropic Clouds with Rotation. *Ian Bonnell & Pierre Bastien.* 374, 610, 106–F5 (1991)
- Hydrodynamic Pulsation Models of Yellow Supergiant Stars in the Post-Asymptotic Giant Branch. *Toshiaki Aikawa.* 374, 700, 107–F13 (1991)
- A Simulation of the Collapse and Fragmentation of Cooling Molecular Clouds. *Joe J. Monaghan & John C. Lattanzio.* 375, 177, 113–C1 (1991)
- The Influence of the Interface between the Heliosphere and the Local Interstellar Medium on the Penetration of the H Atoms to the Solar System. *V.B. Baranov, M. G. Lebedev, & Yu. G. Malama.* 375, 347, 115–C1 (1991)
- Noise-driven Radiative Shocks: A New Model for the Optical Quasi-periodic Oscillations of the AM Herculis Objects. *Michael T. Wolff, Ken S. Wood, & James N. Imamura.* 375, L31, 117–D6 (1991)
- The Dynamical Evolution of the Protosolar Nebula. *Steven P. Ruden & James B. Pollack.* 375, 740, 121–G11 (1991)
- A Powerful Local Shear Instability in Weakly Magnetized Disks. I. Linear Analysis. *Steven A. Balbus & John F. Hawley.* 376, 214, 127–E11 (1991)
- Luminosity Limit for Alpha-Viscosity Accretion Disks. *Edison P. Liang & Amri Wandel.* 376, 746, 135–E8 (1991)
- Nonlinear Instability of the Accretion Line. *Noam Soker.* 376, 750, 135–F1 (1991)
- The Fragmentation of “Pancakes” in a Dark Matter-dominated Universe. *Wenbo Yuan, Joan M. Centrella, & Michael L. Norman.* 376, L29, 137–A11 (1991)
- Dissipational Galaxy Formation. I. Effects of Gasdynamics. *Neal Katz & James E. Gunn.* 377, 365, 144–D1 (1991)
- Fragmentation of Elongated Cylindrical Clouds. III. Formation of Binary and Multiple Systems. *Ian Bonnell, Hugo Martel, Pierre Bastien, Jean-Pierre Arcoragi, & Willy Benz.* 377, 553, 146–E5 (1991)
- Collisions of Giant Stars with Compact Objects: Hydrodynamical Calculations. *Frederic A. Rasio & Stuart L. Shapiro.* 377, 559, 146–F1 (1991)
- A Determination of Relativistic Shock Jump Conditions Using Monte Carlo Techniques. *Donald C. Ellison & Stephen P. Reynolds.* 378, 214, 153–F1 (1991)
- Fragmentation of Elongated Cylindrical Clouds. I. Isothermal Clouds. *Pierre Bastien, Jean-Pierre Arcoragi, Willy Benz, Ian Bonnell, & Hugo Martel.* 378, 255, 154–B5 (1991)
- Alfvén Wave Trapping, Network Microflaring, and Heating in Solar Coronal Holes. *R. L. Moore, Z. E. Musielak, S. T. Suess, & C.-H. An.* 378, 347, 155–C5 (1991)
- Hydrodynamics of Collisions between Binary Stars. *Jeremy Goodman & Lars Hernquist.* 378, 637, 160–C11 (1991)
- Diskoseismology: Probing Accretion Disks. I. Trapped Adiabatic Oscillations. *Michael A. Nowak & Robert V. Waggoner.* 378, 656, 160–E9 (1991)

- Heavy, Overpressured Jets and the Radio Source Hercules A.** *David L. Meier, Alberto C. Sadun, & Kevin R. Lind.* 379, 141, 164-F9 (1991)
- On the Adiabatic Pulsations of Accretion Disks and Rotating Stars.** *James R. Ipser & Lee Lindblom.* 379, 285, 166-E7 (1991)
- The Late-Time Light Curve of SN 1984L.** *Douglas A. Swartz & J. Craig Wheeler.* 379, L13, 169-B7 (1991)
- The Circumstellar Shell of SN 1987A.** *Ding Luo & Richard McCray.* 379, 659, 172-G9 (1991)
- The Collimation of a Time-dependent Stellar Wind.** *S.-H. Kim & A. C. Raga.* 379, 689, 173-C4 (1991)
- Periodic Stellar Pulsations: Stability Analysis and Amplitude Equations.** *J. Robert Buchler, Paweł Moskalik, & Géza Kovács.* 380, 185, 178-D1 (1991)
- Dynamical Buoyancy of Hydrodynamic Eddies.** *E. N. Parker.* 380, 251, 179-B5 (1991)
- Fragmentation of Elongated Cylindrical Clouds. II. Polytropic Clouds.** *Jean-Pierre Arcari, Ian Bonnell, Hugo Mariel, Willy Benz, & Pierre Bastien.* 380, 476, 184-B7 (1991)
- Superfluid Hydrodynamics in Rotating Neutron Stars. I. Nondissipative Equations.** *Gregory Mendell.* 380, 515, 184-F1 (1991)
- Superfluid Hydrodynamics in Rotating Neutron Stars. II. Dissipative Effects.** *Gregory Mendell.* 380, 530, 184-G3 (1991)
- Three-dimensional Compressible Hydrodynamic Convection in the Sun and Stars.** *Murshed Hossain & D. J. Mullan.* 380, 631, 186-A10 (1991)
- Numerical Simulations of Flares on M Dwarf Stars. I. Hydrodynamics and Coronal X-Ray Emission.** *Chung-Chieh Cheng & Roberto Pallavicini.* 381, 234, 191-G12 (1991)
- A Model for Tidally Driven Eccentric Instabilities in Fluid Disks.** *Stephen H. Lubow.* 381, 259, 192-B12 (1991)
- Neutralized and Unneutralized Current Patterns in the Solar Corona.** *D. B. Melrose.* 381, 306, 192-F13 (1991)
- Outflow Hydrodynamics in the Eclipsing Millisecond Pulsar Binaries PSR 1957+20 and PSR 1744–24A.** *Marco Tavani & Leigh Brookshaw.* 381, L21, 194-C13 (1991)
- Three-dimensional Simulations of Black Hole Tori.** *John F. Hawley.* 381, 496, 196-G9 (1991)
- Two-dimensional Hydrodynamic Calculations of the Nonlinear Development of the Goldreich-Schubert-Fricke Instability in a Rotating Annulus.** *D. G. Korycansky.* 381, 515, 197-B1 (1991)
- Outflows Driven by Cosmic-Ray Pressure in Broad Absorption Line QSOs.** *Mitchell C. Begelman, Martijn de Kool, & Marek Sikora.* 382, 416, 206-F9 (1991)
- Rayleigh-Taylor Instability in the Asymmetric Supernova Explosion.** *Shoichi Yamada & Katsuhiro Sato.* 382, 594, 208-G12 (1991)
- A Hydrodynamic Approach to Cosmology: Texture-seeded Cold Dark Matter and Hot Dark Matter Cosmogonies.** *R. Y. Cen, J. P. Ostriker, D. N. Spergel, & N. Turok.* 383, 1, 212-B1 (1991)
- Spherical Accretion onto Black Holes: A Complete Analysis of Stationary Solutions.** *Luciano Nobili, Roberto Turolla, & Luca Zampieri.* 383, 250, 215-C9 (1991)
- The Formation and Role of Water Dimers in a Cometary Atmosphere, with Application to Comet P/Halley.** *J. F. Crifo & Z. Slanina.* 383, 351, 216-F1 (1991)
- Gravitational Instabilities in a Proto-Planetary Disk.** *Hyerim Noh, Ethan T. Vishniac, & William D. Cochran.* 383, 372, 217-A1 (1991)
- Gravitational Fragmentation: A Comparison with W49A.** *Eric R. Keto, John C. Lattanzio, & Joe J. Monaghan.* 383, 639, 222-B12 (1991)
- HYDROMAGNETICS**
- Neutron Star Crustal Plate Tectonics. I. Magnetic Dipole Evolution in Millisecond Pulsars and Low-Mass X-Ray Binaries.** *M. Ruderman.* 366, 261, 4-C5 (1991)
- Magnetotatmospheric Oscillations in Sunspot Umbrae.** *S. S. Hasan.* 366, 328, 5-B7 (1991)
- Reversing the Axisymmetric ( $m = 0$ ) Magnetic Fields in the Milky Way.** *J. P. Vallée.* 366, 450, 8-D9 (1991)
- Three-dimensional Kinematic Reconnection of Plasmoids.** *Yun-Tung Lau & John M. Finn.* 366, 577, 10-B11 (1991)
- Rotation of the Sun's Outer White-Light Corona Determined from Solwind Data.** *Ana G. Nash.* 366, 592, 10-D1 (1991)
- A Twisted Flux-Tube Model for Solar Prominences. III. Magnetic Support.** *C. Ridgway, E. R. Priest, & T. Amari.* 367, 321, 16-A10 (1991)
- On the Radial Structure of Saturn's B Ring.** *Lin-Hua Shan & C. K. Goertz.* 367, 350, 16-D1 (1991)
- On the Subadiabatic Magnetohydrodynamic Overstability in Background Polytropes.** *Yu-Qing Lou.* 367, 367, 16-E9 (1991)
- Universal Particle Acceleration.** *J. I. Katz.* 367, 407, 18-E1 (1991)
- Scattering of Acoustic Waves from a Magnetic Flux Tube Embedded in a Radiating Fluid.** *T. J. Bogdan & M. Knöller.* 369, 219, 38-F1 (1991)
- Numerical Simulations of a Restarting Jet.** *David A. Clarke & Jack O. Burns.* 369, 308, 41-E4 (1991)
- The Finite-Amplitude Behavior of the Joule Mode under Astrophysical Conditions.** *G. Bodo, S. Massaglia, R. Rosner, & A. Ferrari.* 370, 398, 52-C1 (1991)
- Three-dimensional Structures of Magnetostatic Atmospheres. III. A General Formulation.** *B. C. Low.* 370, 427, 52-E8 (1991)
- Implications of Solar  $p$ -Mode Frequency Shifts.** *Peter Goldreich, Norman Murray, Gregory Willet, & Pawan Kumar.* 370, 752, 57-F12 (1991)
- Magnetic Focusing of Precessing Jets.** *Christopher S. Kochanek.* 371, 289, 63-F7 (1991)
- The Sensitivity of Chromospherically Induced  $p$ - and  $f$ -Mode Frequency Shifts to the Height of the Magnetic Canopy.** *David J. Evans & B. Roberts.* 371, 387, 64-G9 (1991)
- Dynamic Magnetic Reconnection at an X-Type Neutral Point.** *I. J. D. Craig & A. N. McClymont.* 371, L41, 66-F1 (1991)
- Viscosity and Inertia in Cosmic-Ray Transport: Effects of an Average Magnetic Field.** *L. L. Williams & J. R. Jokipii.* 371, 639, 69-E3 (1991)
- The Resonant Absorption of  $p$ -Modes by Sunspots with Twisted Magnetic Fields.** *S. M. Chitre & Joseph M. Davila.* 371, 785, 71-C10 (1991)
- Current Sheet Formation and Rapid Reconnection in the Solar Corona.** *A. Bhattacharjee & Xiang Wang.* 372, 321, 78-A1 (1991)
- Why Fast Solar Wind Originates from Slowly Expanding Coronal Flux Tubes.** *Y.-M. Wang & N. R. Sheeley, Jr.* 372, L45, 79-F1 (1991)
- Magnetically Dominated Accretion onto Black Holes.** *Brian Punsly.* 372, 424, 81-B1 (1991)
- Latitudinal Dynamics of Steady Solar Wind Flows.** *W.-H. Yang & R. W. Schunk.* 372, 703, 84-D5 (1991)
- Atmospheric Gradients and the Stability of Expanding Jets.** *Philip E. Hardee, Michael L. Norman, Theodoros Koupelis, & David A. Clarke.* 373, 8, 86-B10 (1991)
- Magnetic Braking, Ambipolar Diffusion, Cloud Cores, and Star Formation: Natural Length Scales and Protostellar Masses.** *Telemachos Ch. Mouschovias.* 373, 169, 88-B3 (1991)
- Stationary Accelerators around Keplerian Disks of Aligned Magnetized Collapsed Objects: Pair Production and Gamma-Ray Emission.** *K. S. Cheng & M. Ruderman.* 373, 187, 88-C9 (1991)
- A Catastrophe Mechanism for Coronal Mass Ejections.** *T. G. Forbes & P. A. Isenberg.* 373, 294, 89-F1 (1991)
- A Slingshot Model for Solar Flares.** *Gregory Benford.* 373, 671, 96-C9 (1991)
- Ineffcient Accretion by the DA2 White Dwarf in V471 Tauri.** *D. J. Mullan, H. L. Shipman, E. M. Sion, & J. MacDonald.* 374, 707, 107-G8 (1991)
- Expansion of a Superbubble in a Uniform Magnetic Field.** *Katia M. Ferrière, Mordecai-Mark Mac Low, & Ellen G. Zweibel.* 375, 239, 114-A4 (1991)
- Force-free Magnetic Fields: Generating Functions and Footpoint Displacements.** *Richard Wolfson & Ritu Verma.* 375, 254, 114-B7 (1991)
- Siphon Flows in Isolated Magnetic Flux Tubes. IV. Critical Flows with Standing Tube Shocks.** *John H. Thomas & Benjamin Montesinos.* 375, 404, 115-G11 (1991)
- How Much Energy Can Be Stored in a Three-dimensional Force-free Magnetic Field?** *J. J. Aly.* 375, L61, 124-C11 (1991)
- The Equilibria and Evolutions of Magnetized, Rotating, Isothermal Clouds. V. The Effect of the Toroidal Field.** *Kohji Tomisaka.* 376, 190, 127-C11 (1991)

- On Turbulent Diffusion of Magnetic Fields and the Loss of Magnetic Flux from Stars.** *Samuel I. Vainshtein & Robert Rosner.* 376, 199, 127-D7 (1991)
- A Powerful Local Shear Instability in Weakly Magnetized Disks. I. Linear Analysis.** *Steven A. Balbus & John F. Hawley.* 376, 214, 127-E11 (1991)
- A Powerful Local Shear Instability in Weakly Magnetized Disks. II. Nonlinear Evolution.** *John F. Hawley & Steven A. Balbus.* 376, 223, 127-F8 (1991)
- Magnetohydrodynamic Turbulence Dissipation and Stochastic Proton Acceleration in Solar Flares.** *James A. Miller.* 376, 342, 129-B11 (1991)
- Suppression of Turbulent Transport by a Weak Magnetic Field.** *Fausto Cattaneo & Samuel I. Vainshtein.* 376, L21, 130-C6 (1991)
- The Dissipation of Magnetohydrodynamic Turbulence Responsible for Interstellar Scintillation and the Heating of the Interstellar Medium.** *Steven R. Spangler.* 376, 540, 133-B5 (1991)
- Evolution to Nonequilibrium in Simple Models of Prominence Filaments.** *Ellen G. Zweibel.* 376, 761, 135-G1 (1991)
- Parametric Study of the Formation of Magnetohydrodynamic Shocks. I. Model.** *Y. C. Whang.* 377, 250, 141-B1 (1991)
- Parametric Study of the Formation of Magnetohydrodynamic Shocks. II. Slow Shocks.** *Y. C. Whang.* 377, 255, 141-B7 (1991)
- Cosmic-Ray Heating of Cooling Flows: A Critical Analysis.** *Michael Loewenstein, Ellen G. Zweibel, & Mitchell C. Begelman.* 377, 392, 144-F4 (1991)
- Asymptotic Structure of Hydromagnetically Driven Relativistic Winds.** *Tzihong Chiueh, Zhi-yun Li, & Mitchell C. Begelman.* 377, 462, 145-D11 (1991)
- Magnetohydrodynamics of an Impulsively Heated, Hard X-Ray Emitting Filament.** *George Roumeliotis & A. Gordon Emslie.* 377, 685, 148-B9 (1991)
- Numerical Study of Compressible Solar Magnetoconvection with an Open Transitional Boundary.** *H. Hanami & T. Tajima.* 377, 694, 148-C6 (1991)
- Cloud Formation by Combined Instabilities in Galactic Gas Layers: Evidence for a  $Q$  Threshold in the Fragmentation of Shearing Wavelets.** *Bruce G. Elmegreen.* 378, 139, 152-F11 (1991)
- Magnetosphere of the Rotation-powered Pulsar: A DC Circuit Model.** *Shinpei Shibata.* 378, 239, 154-A1 (1991)
- A Model for the Formation of Solar Prominences.** *S. K. Antiochos & J. A. Klimchuk.* 378, 372, 155-E6 (1991)
- The Effect of the Mihalas, Hummer, and Däppen Equation of State and the Molecular Opacity on the Standard Solar Model.** *Y.-C. Kim, P. Demarque, & D. B. Guenther.* 378, 407, 156-A10 (1991)
- Prominence Sheets Supported by Constant-Current Force-free Fields. I. Imposition of Normal Magnetic Field Components at the Current Sheet and the Photosphere.** *C. Ridgway, T. Amari, & E. R. Priest.* 378, 773, 162-A1 (1991)
- Dynamo Magnetic Field Modes in Thin Astrophysical Disks: An Adiabatic Computational Approximation.** *T. F. Stepiniski & E. H. Levy.* 379, 343, 167-C9 (1991)
- Joule Heating as an Explanation for the Differential Emission Measure Structure and Systematic Redshifts in the Sun's Lower Transition Region.** *George Roumeliotis.* 379, 392, 167-G9 (1991)
- Magnetically Driven Jets and Winds.** *R. V. E. Lovelace, H. L. Berk, & J. Contopoulos.* 379, 696, 173-D1 (1991)
- Multiple Scattering of Acoustic Waves by a Pair of Uniformly Magnetized Flux Tubes.** *Thomas J. Bogdan & David C. Fox.* 379, 758, 174-B10 (1991)
- Magnetic Field-aligned Electric Potentials in Nonideal Plasma Flows.** *K. Schindler, M. Hesse, & J. Birn.* 380, 293, 179-G9 (1991)
- Magnetohydrodynamic Cosmologies.** *R. Portugal & I. Damiao Soares.* 380, 330, 182-D5 (1991)
- Maximum Energy of Semi-infinite Magnetic Field Configurations.** *P. A. Sturrock.* 380, 655, 186-C8 (1991)
- On the Spontaneous Formation of Electric Current Sheets above a Flexible Solar Photosphere.** *B. C. Low.* 381, 295, 192-F1 (1991)
- Three-dimensional Driven Reconnection in an Axially Bounded Magnetic Field.** *H. R. Strauss.* 381, 508, 197-A8 (1991)
- Parametric Study of the Formation of Magnetohydrodynamic Shocks. III. Fast and Slow Shocks.** *Y. C. Whang.* 381, 559, 197-E10 (1991)
- Electron Acceleration in a Nonlinear Shock Model with Applications to Supernova Remnants.** *Donald C. Ellison & Stephen P. Reynolds.* 382, 242, 203-C1 (1991)
- Coronal Current-Sheet Formation: The Effect of Asymmetric and Symmetric Shears.** *Judith T. Karpen, Spiro K. Antiochos, & C. Richard DeVore.* 382, 327, 204-C4 (1991)
- Coronal Evolution Due to Shear Motion.** *R. S. Steinolfson.* 382, 677, 210-A13 (1991)
- Dynamics of Solar Coronal Magnetic Fields.** *R. B. Dahlburg, S. K. Antiochos, & T. A. Zang.* 383, 420, 217-E1 (1991)
- A New Solar Cycle Model Including Meridional Circulation.** *Y.-M. Wang, N. R. Sheeley, Jr., & A. G. Nash.* 383, 431, 217-F1 (1991)
- Magnetized Supernova Remnants with Cosmic Rays.** *Katia M. Ferrière & Ellen G. Zweibel.* 383, 602, 221-F11 (1991)
- Formation of Dense Charged Bunches in Vacuum Gaps.** *F. Curtis Michel.* 383, 808, 224-C6 (1991)
- Compressible Magnetic Convection: Formulation and Two-dimensional Models.** *Peter A. Fox, Michael L. Theobald, & Sabatino Sofia.* 383, 860, 225-A1 (1991)
- HYPERFINE STRUCTURE**
- The Interstellar D<sub>1</sub> Line at High Resolution.** *L. M. Hobbs & D. E. Welty.* 368, 426, 30-D1 (1991)
- IMAGE PROCESSING**
- The Imaging Performance of the Hubble Space Telescope.** *Christopher J. Burrows, Jon A. Holtzman, S. M. Faber, Pierre Y. Bely, Hashima Hasan, C. R. Lynds, & Daniel Schroeder.* 369, L21, 45-C1 (1991)
- Stellar Photometry with the Hubble Space Telescope Wide-Field/Planetary Camera: A Progress Report.** *Jon A. Holtzman, Edward J. Groth, Robert M. Light, S. M. Faber, Deidre Hunter, Earl J. O'Neil, Jr., Edward J. Shaya, William A. Baum, Bel Campbell, Arthur Code, Douglas G. Currie, S. P. Ewald, J. Jeff Hester, T. Kellogg, Tod R. Lauer, Roger Lynds, Donald P. Schneider, P. Kenneth Seidelmann, & James A. Westphal.* 369, L35, 45-E1 (1991)
- Hubble Space Telescope Wide-Field/Planetary Camera Images of Saturn.** *James A. Westphal, William A. Baum, Tod R. Lauer, G. Edward Danielson, Douglas G. Currie, S. P. Ewald, S. M. Faber, Edward J. Groth, J. Jeff Hester, Robert M. Light, Roger Lynds, Earl J. O'Neil, Jr., P. Kenneth Seidelmann, Edward J. Shaya, & Bradford A. Smith.* 369, L51, 45-G1 (1991)
- INFRARED: GENERAL**
- A Search for Circumstellar Dust around HR 10, a Proposed  $\beta$  Pictoris Star.** *Kwang-Ping Cheng, C. A. Grady, & Frederick C. Bruhweiler.* 366, L87, 11-E7 (1991)
- Submillimeter Solar Limb Profiles Determined from Observations of the Total Solar Eclipse of 1988 March 18.** *T. L. Roellig, E. E. Becklin, J. T. Jefferies, G. A. Kopp, C. A. Lindsey, F. Q. Orrall, & M. W. Werner.* 381, 288, 192-E5 (1991)
- A Model for the Infrared Emission from an OB Star Cluster Environment.** *D. Leisawitz.* 77, 451, 51-B1 (1991)
- INFRARED: SOURCES**
- An Infrared Jet in Centaurus A: A Link to the Extranuclear Activity in Distant Radio Galaxies?** *Marshall Joy, P. M. Harvey, E. V. Tollesstrup, K. Sellgren, P. J. McGregor, & A. R. Hyland.* 366, 82, 2-A13 (1991)
- Far-Infrared Observations and the Structure of Wolf-Rayet Ring Nebulae.** *A. P. Marston.* 366, 181, 3-C9 (1991)
- Far-Infrared and Submillimeter-Wavelength Observations of Star-forming Dense Cores. I. Spectra.** *E. F. Ladd, Fred C. Adams, S. Casey, J. A. Davidson, G. A. Fuller, D. A. Harper, P. C. Myers, & R. Padman.* 366, 203, 3-E7 (1991)
- The Circumstellar Disks of  $\beta$  Pictoris Analogs.** *C. A. Grady, Frederick C. Bruhweiler, K. P. Cheng, W. A. Chiu, & Y. Kondo.* 367, 296, 15-F9 (1991)
- Distribution of Dust about  $\alpha$  Ceti and  $\alpha$  Orionis Based on 11 Micron Spatial Interferometry.** *M. Bester, W. C. Danchi, C. G. Degiacomi, C. H. Townes, & T. R. Geballe.* 367, L27, 17-E1 (1991)
- The Number Counts and Infrared Backgrounds from Infrared-bright Galaxies.** *P. B. Hacking & B. T. Soifer.* 367, L49, 22-B7 (1991)
- Search for Vega-like Nearby Stars with 12 Micron Excess.** *Hartmut H. Aumann & Ronald G. Probst.* 368, 264, 26-D1 (1991)

- CO Excitation and H<sub>2</sub> Masses of Infrared-luminous Galaxies. *Simon J. E. Radford, P. M. Solomon, & D. Downes.* 368, L15, 28-C7 (1991)
- An Infrared Analysis of Puppis A. *Richard G. Arendt, Eli Dwek, & Robert Petre.* 368, 474, 31-A7 (1991)
- Dust Properties around Evolved Stars from Far-Infrared Size Limits. *Paul M. Harvey, Daniel F. Lester, David Brock, & Marshall Joy.* 368, 558, 32-A8 (1991)
- On the Possible Bipolar Nature of 21 Micron *IRAS* Sources. *Bruce J. Hrivnak & Sun Kwok.* 368, 564, 32-B1 (1991)
- Young Stellar Objects Detected by *IRAS*. *Frank O. Clark.* 75, 611, 9-B5 (1991)
- Infrared Polarimetry of Quasars. *Michael L. Sitko & Yudong Zhu.* 369, 106, 37-C5 (1991)
- Zodiacal Emission. II. Dust near the Ecliptic. *William T. Reach.* 369, 529, 44-C13 (1991)
- The Joint Far-Infrared–Optical Luminosity Function for Spiral Galaxies and Data for the Abell 400 and Cancer Clusters. *Edwige Corbelli, Edwin E. Salpeter, & John M. Dickey.* 370, 49, 47-F4 (1991)
- The Effect of Inclination-dependent Selection on *IRAS* Galaxy Detection Rates. *A. J. Connolly, R. D. Joseph, & P. A. James.* 370, 140, 48-G6 (1991)
- Molecular Gas in Luminous Infrared Galaxies. *D. B. Sanders, N. Z. Scoville, & B. T. Soifer.* 370, 158, 49-B1 (1991)
- High-Resolution CO Observations of Luminous Infrared Galaxies with Large  $L_{\text{ir}}/L_B$  Ratios: *IRAS* 10173+0828, Zw 049.057, IRAS 17208–0014. *P. Planesas, I. F. Mirabel, & D. B. Sanders.* 370, 172, 49-C5 (1991)
- Far-Infrared Counterpart to the Optical and H I Plume in the Leo Triplet of Galaxies: NGC 3623, NGC 3627, and NGC 3628. *D. H. Hughes, P. N. Appleton, & J. M. Schombert.* 370, 176, 49-C11 (1991)
- IRAS 23545+6508, a Dissociating Star: Prototype for a New Observational Class? *P. E. Dewdney, R. S. Roger, C. R. Purton, & W. H. McCutcheon.* 370, 243, 50-C1 (1991)
- A Search for Embedded Young Stellar Objects in and near the IC 1396 Complex. *Richard D. Schwartz, Armen L. Gyulbudaghian, & Bruce A. Wilking.* 370, 263, 50-D9 (1991)
- What *COBE* Might See: The Far-Infrared Cosmological Background. *C. A. Beichman & G. Helou.* 370, L1, 53-B1 (1991)
- Interstellar Matter in Early-Type Galaxies. I. The Catalog. *Morton S. Roberts, David E. Hogg, Joel N. Bregman, William R. Forman, & Christine Jones.* 75, 751, 11-F5 (1991)
- Bok Globules and Small Molecular Clouds: Deep *IRAS* Photometry and <sup>12</sup>CO Spectroscopy. *Dan P. Clemens, João Lin Yun, & Mark H. Heyer.* 75, 877, 13-E1 (1991)
- A Survey for Infrared Excesses among High Galactic Latitude SAO Stars. *Robert E. Stencel & Dana E. Backman.* 75, 905, 14-A1 (1991)
- Protostellar Condensations in the Core of NGC 2024. *D. C. Lis, J. E. Carlstrom, & T. G. Phillips.* 370, 583, 55-F5 (1991)
- Far-Infrared Line and Continuum Observations of G0.095+0.012 and the E2 Thermal Radio Filament near the Galactic Center. *Edwin F. Erickson, Sean W. J. Colgan, J. P. Simpson, Robert H. Rubin, Mark Morris, & Michael R. Haas.* 370, L69, 59-C1 (1991)
- A Near-Infrared Imaging Survey of Interacting Galaxies: The Disk-Disk Merger Candidates Subset. *S. A. Stanford & H. A. Bushouse.* 371, 92, 61-C1 (1991)
- Far-Infrared Properties of NGC 6822. *John S. Gallagher III, Deidre A. Hunter, Fred C. Gillett, & Walter L. Rice.* 371, 142, 61-G1 (1991)
- The Infrared Properties of Compact Galactic Radio Sources: The Young and the Restless. *Richard L. White, Robert H. Becker, & David J. Helfand.* 371, 148, 62-A1 (1991)
- A 2.2 Micron Survey in the L1630 Molecular Cloud. *Elizabeth A. Lada, D. L. DePoy, Neal J. Evans II, & Ian Gatley.* 371, 171, 62-C1 (1991)
- Emission from Dust in Visual Reflection Nebulae at Infrared and Submillimeter Wavelengths. *Sean C. Casey.* 371, 183, 62-D1 (1991)
- Near-Infrared Emission-Line Images of Three Herbig-Haro Objects. *Karl R. Stapelfeldt, Charles A. Beichman, J. Jeff Hester, Nicholas Z. Scoville, & Thomas N. Gautier III.* 371, 226, 63-A1 (1991)
- An Extremely High Velocity CO Outflow from NGC 7538 IRS 9. *George F. Mitchell & Tatsuhiko I. Hasegawa.* 371, L33, 66-E1 (1991)
- The Rate and Efficiency of High-Mass Star Formation along the Hubble Sequence. *Nicholas A. Devereux & Judith S. Young.* 371, 515, 68-A1 (1991)
- Multifrequency VLA Observations of Radio Continuum from *IRAS* 16293–2422. *R. Estalella, G. Anglada, L. F. Rodriguez, & G. Garay.* 371, 626, 69-C12 (1991)
- The Carbon-rich Proto-Planetary Nebula *IRAS* 22272+5435. *Bruce J. Hrivnak & Sun Kwok.* 371, 631, 69-D6 (1991)
- IRAS* Detection of Very Cold Dust in the Lynds 134 Cloud Complex. *R. J. Laureijs, F. O. Clark, & T. Prusti.* 372, 185, 76-C4 (1991)
- A Redshift Survey of *IRAS* Galaxies. II. Methods for Determining Self-consistent Velocity and Density Fields. *Amos Yahil, Michael A. Strauss, Marc Davis, & John P. Huchra.* 372, 380, 80-E5 (1991)
- A Redshift Survey of *IRAS* Galaxies. III. Reconstruction of the Velocity and Density Fields in *N*-Body Model Universes. *Marc Davis, Michael A. Strauss, & Amos Yahil.* 372, 394, 80-F7 (1991)
- The Influence of High-Density Environment on the Radio–Far-Infrared Correlation of Spiral Galaxies. *T. K. Menon.* 372, 419, 81-A7 (1991)
- Optical and Near-Infrared Polarimetry of the Infrared Luminous Galaxy *IRAS* 23060+0505. *J. H. Hough, C. Brindle, Beverley J. Wills, D. Wills, & J. Bailey.* 372, 478, 81-F9 (1991)
- Molecular Outflows in the L1641 Region of Orion. *James A. Morgan & John Bally.* 372, 505, 82-B1 (1991)
- Discovery of an Infrared Nucleus in Cygnus A: An Obscured Quasar Revealed? *S. Djorgovski, N. Weir, K. Matthews, & J. R. Graham.* 372, L67, 85-C5 (1991)
- The Extinction to the H<sub>2</sub> Line Emission in the DR 21 Outflow Source. *Daniel Nadeau, Martin Riopel, & T. R. Geballe.* 372, L103, 85-F5 (1991)
- A Millimeter-Wave Line Study of L1287: A Case of Induced Star Formation by Stellar Wind Compression? *Ji Yang, Tomofumi Umemoto, Takahiro Iwata, & Yasuo Fukui.* 373, 137, 87-F7 (1991)
- Near-Infrared Long-Slit Spectroscopy of *IRAS* 14348–1447. *Tadashi Nakajima, Kimiaki Kawara, Minoru Nishida, & Brooke Gregory.* 373, 452, 93-E6 (1991)
- The Dense, Inner Part of the Protostellar Disk: Protostellar Candidates in GGD 27 IRS. *Takuya Yamashita, Yasuhiro Murata, Ryoko Kawabe, Norio Kaifu, & Motohide Tamura.* 373, 560, 95-A1 (1991)
- Spatial Studies of Planetary Nebulae with *IRAS*. *G. W. Hawkins & B. Zuckerman.* 374, 227, 100-G11 (1991)
- Two Micron Morphology of Candidate Protostars. *Motohide Tamura, Ian Gatley, William Waller, & Michael W. Werner.* 374, L25, 103-E7 (1991)
- Infrared Emission in Paired Galaxies. II. Luminosity Functions and Far-Infrared Properties. *Cong Xu & Jack W. Sulentic.* 374, 407, 104-C5 (1991)
- Time Evolution of Interstellar Dust and Far-Infrared Luminosity of Disk Galaxies. *Boqi Wang.* 374, 456, 104-G1 (1991)
- Integrated Far-Infrared Background from Galaxies. *Boqi Wang.* 374, 465, 104-G12 (1991)
- Infrared Images of M17. *Charles J. Lada, D. L. DePoy, K. M. Merrill, & Ian Gatley.* 374, 533, 105-G1 (1991)
- A Survey of the 158 Micron [C II] Fine-Structure Line in the Central 50 Parsecs of the Galaxy. *A. Poglitsch, G. J. Stacey, N. Geis, M. Haggerty, J. Jackson, M. Rumitz, R. Genzel, & C. H. Townes.* 374, L33, 110-B5 (1991)
- Ram-Pressure Stripping of the Multiphase Interstellar Medium of the Virgo Cluster Elliptical Galaxy M86 (NGC 4406). *David A. White, A. C. Fabian, W. Forman, C. Jones, & C. Stern.* 375, 35, 111-D9 (1991)
- Diffuse Galactic Emission at Millimetric Wavelengths. *P. Andreani, G. Dall' Oglio, L. Martinis, L. Piccirillo, L. Pizzo, L. Rossi, & C. Venturino.* 375, 148, 112-G5 (1991)
- Observations That Link Infrared Cirrus and Ultraviolet Extinction. *John A. Hackwell, James H. Hecht, & Mauricio Tapia.* 375, 163, 113-A9 (1991)
- Telescope Beam-Profil Diagnostics and the Solar Limb. *Charles A. Lindsey & Thomas L. Roellig.* 375, 414, 116-A9 (1991)
- Infrared Broad Emission Lines from an Obscured Quasar, *IRAS* 23060+0505. *Tadashi Nakajima, Nathaniel P. Carleton, & Minoru Nishida.* 375, L1, 117-A7 (1991)

- An Infrared/Optical Investigation of 100 Micron "Cirrus." *Elizabeth S. Paley, Frank J. Low, John T. McGraw, Roc M. Curri, & Hans-Walter Rix.* 376, 335, 129-A13 (1991)
- NGC 1333 IRAS 4: A Very Young, Low-Luminosity Binary System. *Göran Sandell, Colin Aspin, William D. Duncan, Adrian P. G. Russell, & E. Ian Robson.* 376, L17, 130-C1 (1991)
- NGC 7538 IRS 1: Subarcsecond Resolution Recombination Line and  $^{13}\text{NH}_3$  Maser Observations. *R. A. Gaume, K. J. Johnston, H. A. Nguyen, T. L. Wilson, H. R. Dickel, W. M. Goss, & M. C. H. Wright.* 376, 608, 133-G12 (1991)
- A Double Radio Source at the Center of the Outflow in L723. *Guillem Anglada, Robert Estalella, Luis F. Rodríguez, José M. Torrelles, Rosario López, & Jorge Cantó.* 376, 615, 134-A7 (1991)
- Testing Models of Low-Mass Star Formation: High-Resolution Far-Infrared Observations of L1551 IRS 5. *Harold M. Butner, Neal J. Evans II, Daniel F. Lester, Russell M. Levreault, & Stephen E. Strom.* 376, 636, 134-C6 (1991)
- Two Micron Spectroscopy of Infrared Sources in NGC 2071. *D. M. Walther, T. R. Geballe, & E. I. Robson.* 377, 246, 141-A9 (1991)
- Infrared Emission Regions in the Interacting Galaxy System Arp 299. *C. G. Wynn-Williams, S. A. Eales, E. E. Becklin, K.-W. Hodapp, R. D. Joseph, I. S. McLean, D. A. Simons, & G. S. Wright.* 377, 426, 145-A13 (1991)
- Compact Starbursts in Ultraluminous Infrared Galaxies. *J. J. Condon, Z.-P. Huang, Q. F. Yin, & T. X. Thuan.* 378, 65, 151-G5 (1991)
- Galactic Structure from the Spacelab Infrared Telescope. II. Luminosity Models of the Milky Way. *S. M. Kent, T. M. Dame, & G. Fazio.* 378, 131, 152-F1 (1991)
- IRAS 17380-3031: A New Dusty Late WC-Type Wolf-Rayet Star. *Martin Cohen, K. A. van der Hucht, P. M. Williams, & P. S. Thé.* 378, 302, 154-F7 (1991)
- Infrared Polarization Images of Star-forming Regions. I. The Ubiquity of Bipolar Structure. *M. Tamura, Ian Gately, R. R. Joyce, M. Ueno, H. Suto, & M. Sekiguchi.* 378, 611, 160-A1 (1991)
- Massive Star Formation and Superwinds in IRAS 19254-7245 (The "Superantennae"). *Luis Colina, Sebastian Llupiá, & F. Macchetto.* 379, 113, 164-D5 (1991)
- The LkH $\alpha$  101 Infrared Cluster. *M. Barsony, J. M. Schombert, & K. Kis-Halas.* 379, 221, 165-G1 (1991)
- Excitation of the Hydroxyl Maser in OH/IR Stars. *Dale F. Dickinson.* 379, L29, 169-C11 (1991)
- A Catalog of Bright-rimmed Clouds with IRAS Point Sources: Candidates for Star Formation by Radiation-driven Implosion. I. The Northern Hemisphere. *Koji Sugitani, Yasuo Fukui, & Katsuo Ogura.* 379, 59, 44-B1 (1991)
- Direct Evidence for a Bar at the Galactic Center. *Leo Blitz & David N. Spergel.* 379, 631, 172-E1 (1991)
- Location of the Thermal Continuum Source Sagittarius D. *Dariusz C. Lis.* 379, L53, 175-B10 (1991)
- Search for Starbursts among X-Ray-selected Galaxies: Optical Spectroscopy. *Antonella Fruscione & Richard E. Griffiths.* 380, L13, 181-C1 (1991)
- Infrared Hot Spots in the Nucleus of NGC 253. *Duncan A. Forbes, Martin J. Ward, & D. L. DePoy.* 380, L63, 188-C6 (1991)
- Radial Dust Density Profiles in Small Molecular Clouds. *João Lin Yun & Dan P. Clemens.* 381, 474, 196-E7 (1991)
- Near-Infrared Observations of the  $z \sim 2.3$  IRAS Source FSC 10214+4724. *B. T. Soifer, G. Neugebauer, J. R. Graham, K. Matthews, J. M. Mazzarella, C. J. Lonsdale, M. Rowan-Robinson, T. Broadhurst, A. Lawrence, & R. McMahon.* 381, L55, 199-D1 (1991)
- Coconut Stars in the Large Magellanic Cloud. *Neill Reid.* 382, 143, 202-A4 (1991)
- A Cluster of He I Emission-Line Stars in the Galactic Center. *A. Krabbe, R. Genzel, S. Drapatz, & V. Rotaciuc.* 382, L19, 205-C1 (1991)
- Infrared Images, Virgo Spirals, and the Tully-Fisher Law. *R. F. Peletier & S. P. Willner.* 382, 382, 206-C13 (1991)
- Multifrequency Observations of BL Lacertae in 1988. *N. Kawai, M. Matsuo, J. N. Bregman, H. D. Aller, M. F. Aller, P. A. Hughes, S. A. Balbus, T. J. Balonek, K. C. Chambers, R. E. S. Clegg, S. D. Clements, R. J. Leacock, A. G. Smith, R. Goodrich, J. S. Miller, M. Hereld, M. G. Hoare, V. A. Hughes, G. K. Miley, G. H. Moriarty-Schieven, K. Matthews, G. Neugebauer, T. Ohashi, P. F. Roche, H. A. Thronson, E. Valtaoja, H. Teräsanta, J. R. Webb, B. J. Wills, & D. Wills.* 382, 508, 207-G8 (1991)
- A Nearly Unipolar CO Outflow from the HH 46-47 System. *Lawrence M. Chernin & Colin R. Masson.* 382, L93, 211-E3 (1991)
- On the Nature of the Excess 100 Micron Flux Associated with Carbon Stars. *Michael P. Egan & Chun Ming Leung.* 383, 314, 216-B1 (1991)
- Infrared Recombination Lines of Hydrogen from Young Objects in the Southern Galactic Plane. *Sara C. Beck, Jacqueline Fischer, & Howard A. Smith.* 383, 336, 216-D1 (1991)
- Infrared Dust and Millimeter-Wave Carbon Monoxide Emission in the Orion Region. *John Bally, William D. Langer, & Weihong Liu.* 383, 645, 222-C6 (1991)
- Infrared Molecular Spectroscopy toward the Orion IRC2 and IRC7 Sources: A New Probe of Physical Conditions and Abundances in Molecular Clouds. *Neal J. Evans II, J. H. Lacy, & John S. Carr.* 383, 674, 222-E13 (1991)
- New Candidates for Carbon Stars with Silicate Features. *S. Josephine Chan & Sun Kwok.* 383, 837, 224-F1 (1991)
- Aperture Synthesis CS(2-1) Observations of a Young Stellar Object GL 490: Accretion Flow in Gas Disk. *Akiko Nakamura, Ryoei Kawabe, Yoshimi Kitamura, Masato Ishiguro, Yasuhiro Murata, & Nagayoshi Ohashi.* 383, L81, 226-F5 (1991)
- New Low-Resolution Spectrometer Spectra for IRAS Sources. *Kevin Volk, Sun Kwok, R. E. Stencel, & E. Brugel.* 77, 607, 53-A1 (1991)
- INFRARED: SPECTRA**
- Far-Infrared Lines from G45.13+0.14 A and K3-50 A: Density Fluctuations in Compact H II Regions. *Sean W. J. Colgan, J. P. Simpson, Robert H. Rubin, Edwin F. Erickson, M. R. Haas, & Jürgen Wolf.* 366, 172, 3-B13 (1991)
- Far-Infrared and Submillimeter-Wavelength Observations of Star-forming Dense Cores. I. Spectra. *E. F. Ladd, Fred C. Adams, S. Casey, J. A. Davidson, G. A. Fuller, D. A. Harper, P. C. Myers, & R. Padman.* 366, 203, 3-E7 (1991)
- CO Fundamental Bands in Late-Type Stars. II. Spectrum Simulations for K-Stars. *Gunter Wiedemann & Thomas R. Ayres.* 366, 277, 4-D9 (1991)
- Infrared Spectroscopy of T Tauri Stars. *C. Giovanardi, S. Gennari, A. Natta, & R. Stanga.* 367, 173, 14-B11 (1991)
- Emission Features in the Spectrum of NGC 7027 near 3.3 Microns at Very High Resolution. *R. P. Lowe, J. M. Moorhead, W. H. Wehlau, & J.-P. Maillard.* 368, 195, 25-E1 (1991)
- Energy Distributions of Symbiotic Novae. *Greg L. Brynn & Sun Kwok.* 368, 252, 26-C1 (1991)
- Near-Infrared Spectroscopy of the Planetary Nebula NGC 6572. *Richard J. Rudy, George S. Rossano, Peter Erwin, & R. C. Puettner.* 368, 468, 30-G13 (1991)
- Axisymmetric Models of Circumstellar Dust Shells. *Alan J. Collison & John D. Fix.* 368, 545, 31-G7 (1991)
- IRAS Low-Resolution Spectral Observations of the 10 and 18 Micron Silicate Emission Features. *Janet P. Simpson.* 368, 570, 32-B13 (1991)
- Observations of  $^{12}\text{CO}$  and  $^{13}\text{CO}$   $J = 9-8$  in Galactic Molecular Clouds. *R. T. Boreiko & A. L. Betz.* 369, 382, 42-E1 (1991)
- High-Resolution Imaging of Brackett- $\gamma$  and H<sub>2</sub> 1-0 S(1) Emission in the Seyfert Galaxy NGC 1068. *V. Rotaciuc, A. Krabbe, M. Cameron, S. Drapatz, R. Genzel, A. Sternberg, & J. W. V. Storey.* 370, L23, 53-D6 (1991)
- Far-Infrared Fourier Transform Spectroscopy of  $^{12}\text{C}^{18}\text{O}$ . *P. De Natale, M. Inguscio, C. Rois Orza, & L. R. Zink.* 370, L53, 53-G5 (1991)
- The Origin of the Far-Infrared Continuum in Active Galactic Nuclei. *L. K. Hunt.* 370, 511, 54-F9 (1991)
- Mapping of Infrared Helium and Hydrogen Line Profiles in the Central Few Arcseconds of the Galaxy. *T. R. Geballe, K. Krisciunas, J. A. Bailey, & R. Wade.* 370, L73, 59-C8 (1991)
- Near-Infrared Long-Slit Spectra of NGC 1068. *M. Tamura, S. G. Kleinmann, N. Z. Scoville, & R. R. Joyce.* 371, 131, 61-F3 (1991)
- Episodic Outflows from High-Mass Protostars. *G. F. Mitchell, J.-P. Maillard, & T. I. Hasegawa.* 371, 342, 64-D1 (1991)
- The Interstellar C-H Stretching Band near 3.4 Microns: Constraints on the Composition of Organic Material in the Diffuse Interstellar

- Medium. *S. A. Sandford, L. J. Allamandola, A. G. G. M. Tielens, K. Sellgren, M. Tapia, & Y. Pendleton.* 371, 607, 69-B1 (1991)
- A New Method for Analyzing *IRAS* Data to Determine the Dust Temperature Distribution. *Taoling Xie, Paul F. Goldsmith, & Weimin Zhou.* 371, L81, 73-D12 (1991)
- Atomic Oxygen Fine-Structure Splittings with Tunable Far-Infrared Spectroscopy. *Lyndon R. Zink, Kenneth M. Evenson, Fusakazu Matsushima, Thomas Neils, & Ruth L. Robinson.* 371, L85, 73-E3 (1991)
- The Mid-Infrared Spectrum of the Carbon Star HD 38218 and Its Possible Relation to Polycyclic Aromatic Hydrocarbons. *Richard H. Buss, Jr., A. G. G. M. Tielens, & Theodore P. Snow.* 372, 281, 77-D8 (1991)
- The H<sub>2</sub> Line Profiles in the Cygnus Loop: Evidence for J-Shocks with Magnetic Precursors. *James R. Graham, Gillian S. Wright, & T. R. Geballe.* 372, L21, 79-C7 (1991)
- Detection of Low-J Pure-Rotational Emission from H<sub>2</sub> in the Orion Bar Region: Evidence for Small-Scale Clumpiness. *Parvinder S. Parmar, John H. Lacy, & Jeffrey M. Achtermann.* 372, L25, 79-D1 (1991)
- Detection of Silicates in the  $\beta$  Pictoris Disk. *C. M. Telesco & R. F. Knacke.* 372, L29, 79-D7 (1991)
- Size and Density Distribution of Very Small Dust Grains in the Barnard 5 Cloud. *Dariusz C. Lis & Chun Ming Leung.* 372, L107, 85-F9 (1991)
- A Sensitive Upper Limit on the Methane Abundance in Comet Levy (1990c). *T. Y. Brooke, A. T. Tokunaga, H. A. Weaver, G. Chin, & T. R. Geballe.* 372, L113, 85-G1 (1991)
- The Far-Infrared Morphology of the Double-ringed Galaxy NGC 4736 (M94): A Ring Surrounding an Extended Nucleus. *Beverly J. Smith, D. F. Lester, P. M. Harvey, & R. W. Pogge.* 373, 66, 86-G5 (1991)
- Parsec-Scale Penetration of Ultraviolet Photons into Molecular Clouds: [C II] 158 Micron Mapping of W3, NGC 1977, and NGC 2023. *J. E. Howe, D. T. Jaffe, R. Genzel, & G. J. Stacey.* 373, 158, 88-A5 (1991)
- The SiH Vibrational Stretch as an Indicator of the Chemical State of Interstellar Grains. *Marla H. Moore, Toshihiko Tanabé, & Joseph A. Nuth.* 373, L31, 91-D7 (1991)
- The 158 Micron [C II] Line: A Measure of Global Star Formation Activity in Galaxies. *G. J. Stacey, N. Geis, R. Genzel, J. B. Lugien, A. Poglitsch, A. Sternberg, & C. H. Townes.* 373, 423, 93-C1 (1991)
- Broad Paschen-Alpha Emission in Two Extremely Infrared Luminous Seyfert 2 Galaxies. *Dean C. Hines.* 374, L9, 103-C7 (1991)
- Infrared Fluorescence of H<sub>2</sub> in NGC 6240: A Starburst Origin for the H<sub>2</sub> Luminosity. *Masuo Tanaka, Tetsuo Hasegawa, & Ian Gatley.* 374, 516, 105-E9 (1991)
- Large-Scale [C II] 158 Micron Emission from the Galaxy. *Hiroshi Shibai, Haruyuki Okuda, Takao Nakagawa, Hideo Matsuhara, Toshinori Maihara, Kohei Mizutani, Yukiyasu Kobayashi, Norihisa Hiromoto, Tetsuo Nishimura, & Frank J. Low.* 374, 522, 105-F1 (1991)
- Observations of [Si II] (35 Micron) and [S I] (25 Micron) in Orion: Evidence for a Wind Shock near IRC2. *Michael R. Haas, David Hollenbach, & Edwin F. Erickson.* 374, 555, 106-B1 (1991)
- A Survey of the 158 Micron [C II] Fine-Structure Line in the Central 50 Parsecs of the Galaxy. *A. Poglitsch, G. J. Stacey, N. Geis, M. Haggerty, J. Jackson, M. Rumitz, R. Genzel, & C. H. Townes.* 374, L33, 110-B5 (1991)
- Infrared Broad Emission Lines from an Obscured Quasar, IRAS 23060+0505. *Tadashi Nakajima, Nathaniel P. Carleton, & Minoru Nishida.* 375, L1, 117-A7 (1991)
- Near-Infrared Emission of Neutral Carbon from Photon-dominated Regions. *V. Escalante, A. Sternberg, & A. Dalgarno.* 375, 630, 120-E1 (1991)
- Origins of the 12-200 Micron Flux in NGC 6946: Starlight and Continuum Dust Emission from an Sc Galaxy. *G. Engargiola.* 76, 875, 36-G5 (1991)
- Discovery of Interstellar Methane: Observations of Gaseous and Solid CH<sub>4</sub> Absorption toward Young Stars in Molecular Clouds. *J. H. Lacy, J. S. Carr, Neal J. Evans II, F. Baas, J. M. Achtermann, & J. F. Arens.* 376, 556, 133-C9 (1991)
- The Spectrum of NGC 7027 from 3080 to 2630 Wavenumbers (3.25-3.80 Microns): Detection of New Atomic and Molecular Hydrogen Lines and New Constraints on the Chemical Sidegroups on Polycyclic Aromatic Hydrocarbons. *Scott A. Sandford.* 376, 599, 133-G1 (1991)
- Solar Gravitational Redshift from the Infrared Oxygen Triplet. *James C. LoPresto, Charles Schrader, & A. Keith Pierce.* 376, 757, 135-F11 (1991)
- Low-Density Photodissociation Regions. *David J. Hollenbach, Takamasa Takahashi, & A. G. G. M. Tielens.* 377, 192, 140-C11 (1991)
- Two Micron Spectroscopy of Infrared Sources in NGC 2071. *D. M. Walther, T. R. Geballe, & E. I. Robson.* 377, 246, 141-A9 (1991)
- The Solar Mg I Spectrum from ATMOS. I. Identification and Preliminary Discussion. *John T. Jefferies.* 377, 337, 142-B5 (1991)
- Shape and Clustering Effects on the Optical Properties of Amorphous Carbon. *François Rouleau & P. G. Martin.* 377, 526, 146-C3 (1991)
- Partially Dissociative Jump Shocks in Molecular Hydrogen. *C. A. Chang & P. G. Martin.* 378, 202, 153-E1 (1991)
- Pure Rotational Spectrum of Hydrogen Deuteride by Far-Infrared Fourier Transform Spectroscopy. *Lorenzo Ulivi, Paolo De Natale, & Massimo Inguscio.* 378, L29, 157-D7 (1991)
- X-Ray Irradiation of Interstellar Grains in Active Galaxies: Evaporation and Infrared Spectra. *G. Mark Voit.* 379, 122, 164-E1 (1991)
- Radiation Transport in Dust in Disk Geometry. I. Application to Externally Heated Interstellar Clouds. *George F. Spagna, Jr., Chun Ming Leung, & Michael P. Egan.* 379, 232, 166-A5 (1991)
- Ionized Carbon in the Large Magellanic Cloud. *R. T. Borekko & A. L. Betz.* 380, L27, 181-D9 (1991)
- On the State of the Emitter of the 3.3 Micron Unidentified Infrared Band: Absorption Spectroscopy of Polycyclic Aromatic Hydrocarbon Species. *Gregory C. Flickinger, Thomas J. Wdowiak, & Percy L. Gómez.* 380, L43, 181-F1 (1991)
- High-Resolution Spectra of the 3.29 Micron Interstellar Emission Feature: A Summary. *A. T. Tokunaga, K. Sellgren, R. G. Smith, T. Nagata, A. Sakata, & Y. Nakada.* 380, 452, 183-G8 (1991)
- Galactic Center Gasdynamics: A One-armed Spiral in a Keplerian Disk. *J. H. Lacy, J. M. Achtermann, & E. Serabyn.* 380, L71, 188-D6 (1991)
- Interstellar Solid CO: Polar and Nonpolar Interstellar Ices. *A. G. G. M. Tielens, A. T. Tokunaga, T. R. Geballe, & F. Baas.* 381, 181, 191-C5 (1991)
- Preliminary Spectral Observations of the Galaxy with a 7° Beam by the *Cosmic Background Explorer (COBE)*. *E. L. Wright, J. C. Mather, C. L. Bennett, E. S. Cheng, R. A. Shafer, D. J. Fixsen, R. E. Eplee, Jr., R. B. Isaacman, S. M. Read, N. W. Boggess, S. Gulkis, M. G. Hauser, M. Janssen, T. Kelsall, P. M. Lubin, S. S. Meyer, S. H. Moseley, Jr., T. L. Murdoch, R. F. Silverberg, G. F. Smoot, R. Weiss, & D. T. Wilkinson.* 381, 200, 191-D12 (1991)
- Near-Infrared Observations of the  $z \sim 2.3$  *IRAS* Source FSC 10214+4724. *B. T. Soifer, G. Neugebauer, J. R. Graham, K. Matthews, J. M. Mazzarella, C. J. Lonsdale, M. Rowan-Robinson, T. Broadhurst, A. Lawrence, & R. McMahon.* 381, L55, 199-D1 (1991)
- Infrared Spectroscopy of Cygnus A: Implications for the Obscured Active Nucleus. *Martin J. Ward, Philip R. Blanco, Andrew S. Wilson, & Minoru Nishida.* 382, 115, 201-E11 (1991)
- CN and HCN in the Infrared Spectrum of IRC +10216. *G. R. Wiedemann, Kenneth H. Hinkle, John J. Keady, D. Deming, & D. E. Jennings.* 382, 321, 204-B10 (1991)
- A Cluster of He I Emission-Line Stars in the Galactic Center. *A. Krabbe, R. Genzel, S. Drapatz, & V. Rotaciuc.* 382, L19, 205-C1 (1991)
- The Optical Depth of the 158 Micron [<sup>12</sup>C II] Line: Detection of the  $F = 1 \rightarrow 0$  [<sup>13</sup>C II] Hyperfine-Structure Component. *G. J. Stacey, C. H. Townes, A. Poglitsch, S. C. Madden, J. M. Jackson, F. Herrmann, R. Genzel, & N. Geis.* 382, L37, 205-E1 (1991)
- A Standard Stellar Spectral Sequence in the Red/Near-Infrared: Classes K5 to M9. *J. Davy Kirkpatrick, Todd J. Henry, & Donald W. McCarthy, Jr.* 77, 417, 50-C5 (1991)

- 10 Micron Spectra of Protostars and the Solid Methanol Abundance.** *W. A. Schutte, A. G. G. M. Tielens, & S. A. Sandford.* 382, 523, 208-A1 (1991)
- Near-Infrared [Fe II] Emission of M82 Supernova Remnants: Implications for Tracing the Supernova Content of Galaxies.** *Matthew A. Greenhouse, Charles E. Woodward, Harley A. Thronson, Jr., Richard J. Rudy, George S. Rossano, Peter Erwin, & R. C. Puettner.* 383, 164, 214-B1 (1991)
- Infrared Recombination Lines of Hydrogen from Young Objects in the Southern Galactic Plane.** *Sara C. Beck, Jacqueline Fischer, & Howard A. Smith.* 383, 336, 216-D1 (1991)
- The 1.0-1.3 Micron Spectrum of LkHα 101.** *Richard J. Rudy, Peter Erwin, George S. Rossano, & R. C. Puettner.* 383, 344, 216-D7 (1991)
- Electric Field Strengths from the Solar 12 Micron Lines.** *Edward S. Chang & William G. Schoenfeld.* 383, 450, 217-G9 (1991)
- 3.3 Micron Emission from Ultraviolet Excitation of Some Aromatic Molecules.** *Jun Shan, Masako Suto, & L. C. Lee.* 383, 459, 218-A7 (1991)
- Detection of  $^{13}\text{C}$ -Ethane in Jupiter's Atmosphere.** *Günter Wiedemann, Gordon L. Björaker, & Donald E. Jennings.* 383, L29, 219-D7 (1991)
- On the Near-Infrared Spectrum of FU Orionis.** *Nuria Calvet, Lee Hartmann, & Scott J. Kenyon.* 383, 752, 223-E6 (1991)
- New Low-Resolution Spectrometer Spectra for IRAS Sources.** *Kevin Volk, Sun Kwok, R. E. Stencel, & E. Brugel.* 77, 607, 53-A1 (1991)
- INSTABILITIES**
- Nonaxisymmetric Instabilities in Rotating Shear Flows: Internal Gravity Modes in Stratified Media and Analogies with Plane Flows.** *P. Ghosh & M. A. Abramowicz.* 366, 221, 3-F13 (1991)
- Thermal Instabilities in Proto-Globular Clusters Resulting from Time-dependent Potentials.** *Stephen D. Murray & Douglas N. C. Lin.* 367, 149, 13-G6 (1991)
- A Search for Instability in Two Families of Spherical Stellar Models.** *Martin D. Weinberg.* 368, 66, 24-A1 (1991)
- The Dynamic Instability of Adiabatic Blast Waves.** *Dongsu Ryu & Ethan T. Vishniac.* 368, 411, 30-B12 (1991)
- Rayleigh-Taylor Instabilities and Mixing in the Helium Star Models for Type Ib/Ic Supernovae.** *Izumi Hachisu, Takuya Matsuda, Ken'ichi Nomoto, & Toshikazu Shigeyama.* 368, L27, 35-B4 (1991)
- Self-Organization of Cosmic Radiation Pressure Instability.** *Craig J. Hogan.* 369, 300, 41-D8 (1991)
- The Finite-Amplitude Behavior of the Joule Mode under Astrophysical Conditions.** *G. Bodo, S. Massaglia, R. Rosner, & A. Ferrari.* 370, 398, 52-C1 (1991)
- On the Thermal Stability of Slabs, Cylinders, and Spheres.** *Miguel H. Ibáñez S., & Florencio P. Plachco M.* 370, 743, 57-F1 (1991)
- On Magnetothermal Instability in Cluster Cooling Flows.** *Steven A. Balbus.* 372, 25, 74-C13 (1991)
- A Powerful Local Shear Instability in Weakly Magnetized Disks. I. Linear Analysis.** *Steven A. Balbus & John F. Hawley.* 376, 214, 127-E1 (1991)
- A Powerful Local Shear Instability in Weakly Magnetized Disks. II. Nonlinear Evolution.** *John F. Hawley & Steven A. Balbus.* 376, 223, 127-F8 (1991)
- Stability of Nonrotating Stellar Systems. II. Prolate Shell-Orbit Models.** *David Merritt & Lars Hernquist.* 376, 439, 131-G13 (1991)
- Nonlinear Instability of the Accretion Line.** *Noam Soker.* 376, 750, 135-F1 (1991)
- Modes of Oscillation of a Uniformly Rotating, Homogeneous Spheroid of Stars.** *Peter O. Vandervoort.* 377, 49, 138-F1 (1991)
- Cloud Formation by Combined Instabilities in Galactic Gas Layers: Evidence for a  $Q$  Threshold in the Fragmentation of Shearing Wavelets.** *Bruce G. Elmegreen.* 378, 139, 152-F11 (1991)
- The Secular Instability of Axisymmetric Collisionless Star Clusters.** *Henry E. Kandrup.* 380, 511, 184-E9 (1991)
- A Model for Tidally Driven Eccentric Instabilities in Fluid Disks.** *Stephen H. Lubow.* 381, 259, 192-B12 (1991)
- Simulations of Tidally Driven Eccentric Instabilities with Application to Superhumps.** *Stephen H. Lubow.* 381, 268, 192-C9 (1991)
- Three-dimensional Simulations of Black Hole Tori.** *John F. Hawley.* 381, 496, 196-G9 (1991)
- Two-dimensional Hydrodynamic Calculations of the Nonlinear Development of the Goldreich-Schubert-Fricke Instability in a Rotating Annulus.** *D. G. Korycansky.* 381, 515, 197-B1 (1991)
- Inverse-Compton Gamma-Ray Emission from Chaotic, Early-Type Stellar Winds and Its Detectability by *Gamma Ray Observatory*.** *Wan Chen & Richard L. White.* 381, L63, 199-E1 (1991)
- Influence of a Dark Halo on the Stability of Elliptical Galaxies.** *M. Stiavelli & L. S. Sparke.* 382, 466, 207-D1 (1991)
- On the Effects of Interstellar Gas on the Oscillations and the Stability of Galaxies.** *Peter O. Vandervoort.* 383, 498, 220-E1 (1991)
- INSTRUMENTS**
- An Optical Fiber System to Perform Bidimensional Spectroscopy.** *S. Arribas, E. Mediavilla, & J. L. Rasilla.* 369, 260, 39-B9 (1991)
- The Imaging Performance of the *Hubble Space Telescope*.** *Christopher J. Burrows, Jon A. Holtzman, S. M. Faber, Pierre Y. Bely, Hashima Hasan, C. R. Lynds, & Daniel Schroeder.* 369, L21, 45-C1 (1991)
- Spectral Observations of the Extreme Ultraviolet Background.** *Simon E. Labov & Stuart Bowyer.* 371, 810, 71-F1 (1991)
- The Case for a Liquid Mirror in a Lunar-based Telescope.** *Ermanno F. Borra.* 373, 317, 89-G12 (1991)
- Ca II H and K Measurements Made at Mount Wilson Observatory, 1966-1983.** *Douglas K. Duncan, Arthur H. Vaughan, Olin C. Wilson, George W. Preston, James Frazer, Howard Lanning, Anthony Misch, Jean Mueller, David Soymier, L. Woodard, Sallie L. BAliunas, Robert W. Noyes, Lee W. Hartmann, Alain Porter, Cornelis Zwaan, Frans Middelkoop, René G. M. Rutten, & Dimitri Mihalas.* 76, 383, 29-G9 (1991)
- First Results from the Goddard High-Resolution Spectrograph: A Demonstration of Spectral Resolution and Experiments with Deconvolution.** *Glenn M. Wahlgren, David S. Leckrone, Steven N. Shore, Don J. Lindler, Ronald L. Gilliland, & Dennis C. Ebbets.* 377, L41, 143-E6 (1991)
- Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy.** *C. W. Akerlof, M. F. Cawley, M. Chantell, D. J. Fegan, K. Harris, A. M. Hillas, D. G. Jennings, R. C. Lamb, M. A. Lawrence, M. J. Lang, D. A. Lewis, D. I. Meyer, G. Mohanty, K. S. O'Flaherty, M. Punch, P. T. Reynolds, M. S. Schubnell, T. C. Weekes, & T. Whitaker.* 377, L97, 150-E6 (1991)
- The Intensity and Spectrum of the Diffuse X-Ray Background.** *X. Wu, T. Hamilton, D. J. Helfand, & Q. Wang.* 379, 564, 171-F1 (1991)
- INTERFEROMETRY**
- Anatomy of a Merger: CO in Arp 299 (IC 694-NGC 3690).** *Anneila Sargent & Nick Scoville.* 366, L1, 6-A7 (1991)
- VLA Radio Recombination Line Observations of Sagittarius A West.** *D. A. Roberts, W. W. Goss, J. H. van Gorkom, & J. P. Leahy.* 366, L15, 6-B13 (1991)
- Measurements of the Diameter of the Supernova SN 1987A.** *M. Karovska, P. Nisenson, C. Standley, & S. R. Heathcote.* 367, L15, 17-C8 (1991)
- Distribution of Dust about  $\alpha$  Ceti and  $\alpha$  Orionis Based on 11 Micron Spatial Interferometry.** *M. Bester, W. C. Danchi, C. G. Degiacomi, C. H. Townes, & T. R. Geballe.* 367, L27, 17-E1 (1991)
- Millimeter Interferometer Observations of Infrared Luminous Galaxies: NGC 828 and NGC 6240.** *Z. Wang, N. Z. Scoville, & D. B. Sanders.* 368, 112, 24-D9 (1991)
- Ultramassive ( $\sim 10^{11} M_{\odot}$ ) Dark Core in the Luminous Infrared Galaxy NGC 6240?** *Jonathan Bland-Hawthorn, Andrew S. Wilson, & R. Brent Tully.* 371, L19, 66-C7 (1991)
- Multifrequency VLA, VLBI, and Single-Dish Observations of the Quasar 4C 39.25.** *Alan P. Marscher, Yun Fei Zhang, David B. Shaffer, Hugh D. Aller, & Margo F. Aller.* 371, 491, 67-E12 (1991)
- VLBI Observations of Interstellar Ammonia Masers.** *Preeti Pratap, Karl M. Menten, Mark J. Reid, James M. Moran, & C. Malcolm Walmsley.* 373, L13, 91-B12 (1991)
- Asymmetries in the Atmosphere of Mira.** *M. Karovska, P. Nisenson, C. Papaliolios, & R. P. Boyle.* 374, L51, 110-D1 (1991)
- Imaging Spectrophotometry of Ionized Gas in NGC 1068. II. Global Ionization of the Inner Disk.** *Jonathan Bland-Hawthorn, James Sokolowski, & Gerald Cecil.* 375, 78, 112-A1 (1991)
- Imaging Spectrophotometry of Ionized Gas in NGC 1068. III. Anisotropic Excitation of the Large-Scale Disk by Scattering of**

- Nuclear Continuum. *James Sokolowski, Jonathan Bland-Hawthorn, & Gerald Cecil.* 375, 583, 120-A1 (1991)
- Compact Starbursts in Ultraluminous Infrared Galaxies. *J. J. Condon, Z.-P. Huang, Q. F. Yin, & T. X. Thuan.* 378, 65, 151-G5 (1991)
- A Finger-like Extension of the 20 Kilometer per Second Cloud toward the Galactic Center. *Sachiko K. Okumura, Masato Ishiguro, Edward B. Fomalont, Tetsuo Hasegawa, Takashi Kasuga, Koh-Ichiro Morita, Ryohei Kawabe, & Hideyuki Kobayashi.* 378, 127, 152-E9 (1991)
- First- and Second-Epoch VLBI Observations of the Gravitational Lens System 2016+112. *M. B. Heflin, M. V. Gorenstein, C. R. Lawrence, & B. F. Burke.* 378, 519, 158-G9 (1991)
- R Aquarii: H $\alpha$  Map of Subarcsecond Inner Structure. *E. K. Hege, C. K. Allen, & W. J. Cocke.* 381, 543, 197-D6 (1991)
- Milliarcsecond Radio Structure of Weak-lined T Tauri Stars. *R. B. Phillips, C. J. Lonsdale, & E. D. Feigelson.* 382, 261, 203-D9 (1991)
- The Radio "Lobes" of Scorpius X-1 Are Unrelated Background Sources. *E. B. Fomalont & B. J. Geldzahler.* 383, 289, 215-G1 (1991)
- ### INTERGALACTIC MEDIUM
- New Photoionization Models of Intergalactic Clouds. *Megan Donahue & J. Michael Shull.* 383, 511, 220-F1 (1991)
- ### INTERPLANETARY MEDIUM
- Zodiacal Emission. II. Dust near the Ecliptic. *William T. Reach.* 369, 529, 44-C13 (1991)
- Spatial Distribution of the Interplanetary Dust Deduced by Infrared Observations. *P. de Bernardis, F. Feminella, & G. Moreno.* 370, 396, 52-B10 (1991)
- Solar Cycle Variation of the Interplanetary Magnetic Field Spiral. *Charles W. Smith & John W. Bieber.* 370, 435, 52-F4 (1991)
- Ablation of Silicate Particles in High-Speed Continuum and Transition Flow with Application to the Collection of Interplanetary Dust Particles. *Aaron J. Rulison, Richard C. Flagan, Thomas J. Ahrens, & Wayne F. Miller.* 371, 432, 65-E5 (1991)
- Cosmic-Ray Diurnal Anisotropy, 1936–1988: Implications for Drift and Modulation Theories. *John W. Bieber & Jiasheng Chen.* 372, 301, 77-F4 (1991)
- Solar Particle Abundances at Energies Greater than 1 MeV per Nucleon and the Role of Interplanetary Shocks. *H. V. Cane, D. V. Reames, & T. T. von Rosenvinge.* 373, 675, 96-D1 (1991)
- Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of Voyager 2. *T. P. Krisher, J. D. Anderson, D. D. Morabito, S. W. Asmar, S. E. Borutzki, M. L. Delitsky, A. C. Densmore, P. M. Eshe, G. D. Lewis, M. J. Maurer, D. C. Roth, Y. H. Son, T. R. Spilker, D. N. Sweetnam, A. H. Taylor, G. L. Tyler, D. L. Gresh, & P. A. Rosen.* 375, L57, 124-C6 (1991)
- Statistical Properties of Shock-accelerated Ions in the Outer Heliosphere. *L. J. Lanzerotti, R. E. Gold, D. J. Thomson, R. E. Decker, C. G. Maclennan, & S. M. Krimigis.* 380, L93, 188-F10 (1991)
- On the Cosmological Significance of the Apparent Deficit of Small Interplanetary Scintillation Sources. *Chris A. Hajjvassiliou.* 381, 3, 189-A13 (1991)
- Interplanetary Transport of Decay Protons from Solar Flare Neutrons. *D. Ruffolo.* 382, 688, 210-B12 (1991)
- ### INTERSTELLAR: ABUNDANCES
- The Physical Properties of Giant Molecular Cloud Complexes in the Outer Galaxy: Implications for the Ratio of H<sub>2</sub> Column Density to <sup>12</sup>CO Intensity. *T. J. Sodroski.* 366, 95, 2-C1 (1991)
- The *In Situ* Formation of Large Molecules in Dense Interstellar Clouds. *Eric Herbst.* 366, 133, 2-F4 (1991)
- Water Vapor in the Orion Molecular Cloud. *R. F. Knacke & H. P. Larson.* 367, 162, 14-A10 (1991)
- Ultraviolet Interstellar Lines in the Spectrum of  $\pi$  Scorpii Recorded at 2 Kilometers per Second Resolution. *Charles L. Joseph & Edward B. Jenkins.* 368, 201, 25-E9 (1991)
- Predicted Profiles of Ultraviolet Interstellar Absorption Lines. *D. E. Welty, L. M. Hobbs, & D. G. York.* 75, 425, 6-E5 (1991)
- The Formation of Oxygen-containing Organic Molecules in the Orion Compact Ridge. *T. J. Millar, Eric Herbst, & S. B. Charnley.* 369, 147, 37-F1 (1991)
- High-Density Gas in the Core of the Sagittarius B2 Molecular Cloud. *Dariusz C. Lis & Paul F. Goldsmith.* 369, 157, 37-G11 (1991)
- Fossil DCN in Orion-KL. *Jeffrey G. Mangum, Richard L. Plambeck, & Ahwyn Wootten.* 369, 169, 38-A11 (1991)
- Laboratory Observation of the <sup>3</sup>P<sub>1</sub>-<sup>3</sup>P<sub>0</sub> Transition of the Neutral Carbon Atom by Submillimeter-Wave Absorption Spectroscopy. *Satoshi Yamamoto & Shuji Saito.* 370, L103, 59-F7 (1991)
- Ultraviolet Interstellar Absorption toward HD 156359, a Halo Star at 11 Kiloparsecs in the Direction  $l = 329^\circ$  and  $b = -15^\circ$ . *Kenneth R. Sembach, Blair D. Savage, & Derck Massa.* 372, 81, 75-A11 (1991)
- The Local Interstellar Medium toward the Center of Loop I. *Miriam Centurion & Giovanni Vladilo.* 372, 494, 82-A1 (1991)
- The Gas-Phase Chemistry of Organic Molecules in Interstellar Clouds with Dynamical Mixing. *J.-P. Chieze, G. Pineau des Forets, & Eric Herbst.* 373, 110, 87-D4 (1991)
- Large-Scale [C II] 158 Micron Emission from the Galaxy. *Hiroshi Shibai, Haruyuki Okuda, Takao Nakagawa, Hideo Matsuhara, Toshinori Maihara, Kohei Mizutani, Yukiyasu Kobayashi, Norihisa Hiromoto, Tetsuo Nishimura, & Frank J. Low.* 374, 522, 105-F1 (1991)
- Observations of [Si II] (35 Micron) and [S I] (25 Micron) in Orion: Evidence for a Wind Shock near IRc2. *Michael R. Haas, David Hollenbach, & Edwin F. Erickson.* 374, 555, 106-B1 (1991)
- A Molecular Line Survey of Sagittarius B2 and Orion-KL from 70 to 115 GHz. II. Analysis of the Data. *B. E. Turner.* 76, 617, 33-D1 (1991)
- Discovery of Interstellar Methane: Observations of Gaseous and Solid CH<sub>4</sub> Absorption toward Young Stars in Molecular Clouds. *J. H. Lacy, J. S. Carr, Neal J. Evans II, F. Baas, J. M. Achtermann, & J. F. Arenz.* 376, 556, 133-C9 (1991)
- Observations and Chemistry of Interstellar Refractory Elements. *B. E. Turner.* 376, 573, 133-E1 (1991)
- Water in Dense Molecular Clouds. *P. G. Wannier, L. Pagani, T. B. H. Kuiper, M. A. Ferking, S. Gulkis, P. Encrenaz, H. M. Pickett, A. Lecacheux, & W. J. Wilson.* 377, 171, 140-B1 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Element Abundances as a Function of Velocity in the Neutral Gas toward  $\zeta$  Persei. *Blair D. Savage, Jason A. Cardelli, Frederick C. Bruhweiler, Andrew M. Smith, Dennis C. Ebbets, & Kenneth R. Sembach.* 377, L53, 143-F6 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Elemental Abundances in the Diffuse Clouds toward  $\zeta$  Persei. *Jason A. Cardelli, Blair D. Savage, Frederick C. Bruhweiler, Andrew M. Smith, Dennis C. Ebbets, Kenneth R. Sembach, & Ulysses J. Sofia.* 377, L57, 143-F11 (1991)
- Interstellar <sup>12</sup>C/<sup>13</sup>C Ratio Revisited. *Philippe Crane, Dennis J. Hegyi, & David L. Lambert.* 378, 181, 153-C1 (1991)
- Molecular Gas in Elliptical Galaxies. *Joanna F. Lees, G. R. Knapp, Michael P. Rupen, & T. G. Phillips.* 379, 177, 165-B1 (1991)
- The Interstellar <sup>12</sup>CN/<sup>13</sup>CN Ratio toward  $\zeta$  Persei. *Mary Elizabeth Kaiser, Isabel Hawkins, & Edward L. Wright.* 379, 267, 166-D1 (1991)
- Detection of Interstellar H<sub>3</sub>O<sup>+</sup>: A Confirming Line. *Ahwyn Wootten, J. G. Mangum, B. E. Turner, M. Bogey, F. Boulanger, F. Combes, P. J. Encrenaz, & M. Gerin.* 380, L79, 188-E6 (1991)
- Molecular Line Survey of Sagittarius B2(M) from 330 to 355 GHz and Comparison with Sagittarius B2(N). *E. C. Sutton, P. A. Jaminet, W. C. Danchi, & Geoffrey A. Blake.* 77, 255, 47-F1 (1991)
- Interstellar Environments Probed by Ca I Absorption and the Effects of Density-dependent Depletions. *Jason A. Cardelli, S. R. Federman, & V. V. Smith.* 381, L17, 194-C7 (1991)
- Further High-Resolution Na I Observations of the Local Interstellar Medium. *B. Y. Welsh, P. W. Vedder, J. V. Vallerga, & N. Craig.* 381, 462, 196-D7 (1991)
- Interstellar Gas Phase Abundance of Carbon, Oxygen, Nitrogen, Copper, Gallium, Germanium, and Krypton toward  $\zeta$  Ophiuchi. *Jason A. Cardelli, Blair D. Savage, & Dennis C. Ebbets.* 383, L23, 219-D1 (1991)
- Infrared Molecular Spectroscopy toward the Orion IRc2 and IRc7 Sources: A New Probe of Physical Conditions and Abundances in Molecular Clouds. *Neal J. Evans II, J. H. Lacy, & John S. Carr.* 383, 674, 222-E13 (1991)

**INTERSTELLAR: GRAINS**

- Photolevitation of Diffuse Clouds.** *José Franco, Federico Ferrini, Andrea Ferrara, & Bruno Barsella.* 366, 443, 8-D1 (1991)
- A Search for Circumstellar Dust around HR 10, a Proposed  $\beta$  Pictoris Star.** *Kwang-Ping Cheng, C. A. Grady, & Frederick C. Bruhweiler.* 366, L87, 11-E7 (1991)
- Extinction and Polarization of Transmitted Light by Partially Aligned Nonspherical Grains.** *Mikhail I. Mishchenko.* 367, 561, 20-C8 (1991)
- The Nature of the Dust around R Coronae Borealis Stars: Isolated Amorphous Carbon or Graphite Fractals?** *J. H. Hecht.* 367, 635, 21-B9 (1991)
- Search for H<sub>2</sub>-He Alloy Formation at Low Pressures and Cosmic Snowballs.** *M. Leventhal & A. P. Mills, Jr.* 368, 178, 25-C7 (1991)
- Magnetic Flux Loss from Interstellar Clouds with Various Grain-Size Distributions.** *Ryoichi Nishi, Takenori Nakano, & Toyoharu Umebayashi.* 368, 181, 25-C11 (1991)
- Emission Features in the Spectrum of NGC 7027 near 3.3 Microns at Very High Resolution.** *R. P. Lowe, J. M. Moorhead, W. H. Wehlau, & J.-P. Maillard.* 368, 195, 25-E1 (1991)
- An Infrared Analysis of Puppis A.** *Richard G. Arendt, Eli Dwek, & Robert Petre.* 368, 474, 31-A7 (1991)
- Dust Properties around Evolved Stars from Far-Infrared Size Limits.** *Paul M. Harvey, Daniel F. Lester, David Brock, & Marshall Joy.* 368, 558, 32-A8 (1991)
- Dust and Molecular Properties of the Low-Opacity Cloud Lynds 1563.** *Frank O. Clark, R. J. Laureijs, & Lauri L. Wardell.* 370, 237, 50-B7 (1991)
- Polarimetric Mapping of Orion Using MILLIPOL: Magnetic Activity in BN/KL.** *Robert W. Leach, Dan P. Clemens, Brian D. Kane, & Richard Barvainis.* 370, 257, 50-D1 (1991)
- Emission from Dust in Visual Reflection Nebulae at Infrared and Submillimeter Wavelengths.** *Sean C. Casey.* 371, 183, 62-D1 (1991)
- The Temperature of Large Dust Grains in Molecular Clouds.** *F. O. Clark, R. J. Laureijs, & T. Prusti.* 371, 602, 69-A7 (1991)
- The Interstellar C-H Stretching Band near 3.4 Microns: Constraints on the Composition of Organic Material in the Diffuse Interstellar Medium.** *S. A. Sandford, L. J. Allamandola, A. G. G. M. Tielens, K. Sellgren, M. Tapia, & Y. Pendleton.* 371, 607, 69-B1 (1991)
- A New Method for Analyzing IRAS Data to Determine the Dust Temperature Distribution.** *Taoling Xie, Paul E. Goldsmith, & Weinan Zhou.* 371, L81, 73-D12 (1991)
- The Albedo and Scattering Phase Function of Interstellar Dust and the Diffuse Background at Far-Ultraviolet Wavelengths.** *Mark Hurwitz, Stuart Bowyer, & Christopher Martin.* 372, 167, 76-A12 (1991)
- IRAS Detection of Very Cold Dust in the Lynds 134 Cloud Complex.** *R. J. Laureijs, F. O. Clark, & T. Prusti.* 372, 185, 76-C4 (1991)
- Size and Density Distribution of Very Small Dust Grains in the Barnard 5 Cloud.** *Dariusz C. Lis & Chun Ming Leung.* 372, L107, 85-F9 (1991)
- The SiH Vibrational Stretch as an Indicator of the Chemical State of Interstellar Grains.** *Marla H. Moore, Toshihiko Tanabé, & Joseph A. Nuth.* 373, L31, 91-D7 (1991)
- The Dense, Inner Part of the Protostellar Disk: Protostellar Candidates in GGD 27 IRS.** *Takuya Yamashita, Yasuhiro Murata, Ryohei Kawabe, Norio Kaifu, & Motohide Tamura.* 373, 560, 95-A1 (1991)
- <sup>26</sup>**Al and  $^{16}$ O in the Early Solar System: Clues from Meteoritic  $\text{Al}_2\text{O}_3$ .** *Edward Anders, Alois Virág, Ernst Zinner, & Roy S. Lewis.* 373, L77, 97-F6 (1991)
- Spatial Studies of Planetary Nebulae with IRAS.** *G. W. Hawkins & B. Zuckerman.* 374, 227, 100-G11 (1991)
- Continuum Emission at 1 Millimeter from the Elliptical Galaxy NGC 205.** *Michel Fich & Paul Hodge.* 374, L17, 103-D7 (1991)
- Time Evolution of Interstellar Dust and Far-Infrared Luminosity of Disk Galaxies.** *Boqi Wang.* 374, 456, 104-G1 (1991)
- Diffuse Galactic Emission at Millimetric Wavelengths.** *P. Andreani, G. Dall'Olgo, L. Martinis, L. Piccirillo, L. Pizzo, L. Rossi, & C. Venturino.* 375, 148, 112-G5 (1991)
- Formaldehyde in Envelopes of Interstellar Dark Clouds.** *S. R. Federman & M. Allen.* 375, 157, 113-A1 (1991)
- Trapped H<sub>2</sub>O in SiO Condensate: An Explanation for the 3 Micron Band Observed toward the Galactic Center.** *S. Wada, A. Sakata, & A. T. Tokunaga.* 375, L17, 117-C1 (1991)
- On the Long-Wavelength Absorption by Interstellar Dust.** *Edward L. Wright.* 375, 608, 120-C5 (1991)
- Molecular Hydrogen Polarization Images of OMC-1.** *Michael G. Burton, N. R. Minchin, J. H. Hough, C. Aspin, D. J. Axon, & J. A. Bailey.* 375, 611, 120-C9 (1991)
- Spectroscopic Study of Direct and Dust-scattered Line Emission in the HH 1-HH 2 System.** *J. Solf & K. H. Böhm.* 375, 618, 120-D3 (1991)
- An Infrared/Optical Investigation of 100 Micron "Cirrus."** *Elizabeth S. Paley, Frank J. Low, John T. McGraw, Roc M. Curri, & Hans-Walter Rix.* 376, 335, 129-A13 (1991)
- NGC 1333 IRS 4: A Very Young, Low-Luminosity Binary System.** *Göran Sandell, Colin Aspin, William D. Duncan, Adrian P. G. Russell, & E. Ian Robson.* 376, L17, 130-C1 (1991)
- Infrared and Visible Photometry of the Gravitational Lens System 2237+030.** *Daniel Nadeau, H. K. C. Yee, W. J. Forrest, J. D. Garnett, Z. Ninkov, & J. L. Pipher.* 376, 430, 131-G1 (1991)
- X-Ray Halos as Diagnostics of Interstellar Grains.** *John S. Mathis & C.-W. Lee.* 376, 490, 132-E1 (1991)
- Very Small Grains and the Infrared Colors of Galaxies.** *G. Helou, C. Ryer, & B. T. Soifer.* 376, 505, 132-F6 (1991)
- The Spectrum of NGC 7027 from 3080 to 2630 Wavenumbers (3.25–3.80 Microns): Detection of New Atomic and Molecular Hydrogen Lines and New Constraints on the Chemical Sidegroups on Polycyclic Aromatic Hydrocarbons.** *Scott A. Sandford.* 376, 599, 133-G1 (1991)
- Testing Models of Low-Mass Star Formation: High-Resolution Far-Infrared Observations of L1551 IRS 5.** *Harold M. Butner, Neal J. Evans II, Daniel F. Lester, Russell M. Levreault, & Stephen E. Strom.* 376, 636, 134-C6 (1991)
- Theoretical Studies of the Absorption Spectra of Polycyclic Aromatic Hydrocarbons.** *Sylvio Canuto, Michael C. Zerner, & Geerd H. E. Diercksen.* 377, 150, 139-G3 (1991)
- Shape and Clustering Effects on the Optical Properties of Amorphous Carbon.** *François Rouleau & P. G. Martin.* 377, 526, 146-C3 (1991)
- Positron Annihilation in the Interstellar Medium.** *Nidhal Guessoum, Reuven Ramaty, & Richard E. Lingefelter.* 378, 170, 153-B4 (1991)
- X-Ray Irradiation of Interstellar Grains in Active Galaxies: Evaporation and Infrared Spectra.** *G. Mark Voit.* 379, 122, 164-E1 (1991)
- A Grain-heated, Dusty Planetary Nebula in M22.** *Kazimierz J. Borkowski & J. Patrick Harrington.* 379, 168, 165-B1 (1991)
- Radiation Transport in Dust in Disk Geometry. I. Application to Externally Heated Interstellar Clouds.** *George F. Spagna, Jr., Chun Ming Leung, & Michael P. Egan.* 379, 232, 166-A5 (1991)
- Vacuum Ultraviolet Imagery of the Virgo Cluster Region. III. Diffuse Far-Ultraviolet Radiation at High Galactic Latitudes.** *Takashi Onaka & Keiichi Kodaira.* 379, 532, 171-C5 (1991)
- Sticking Probability of H and D Atoms on Amorphous Ice: A Computational Study.** *V. Buch & Q. Zhang.* 379, 647, 172-F7 (1991)
- Desorption of Large Molecules from Grains in Dense Interstellar Clouds.** *R. E. Johnson, V. Pirronello, B. Sundqvist, & B. Donn.* 379, L75, 175-D12 (1991)
- On the State of the Emitter of the 3.3 Micron Unidentified Infrared Band: Absorption Spectroscopy of Polycyclic Aromatic Hydrocarbon Species.** *Gregory C. Flickinger, Thomas J. Wdowiak, & Percy L. Gómez.* 380, L43, 181-F1 (1991)
- Millimeter Continuum Observations of Galactic Center Giant Molecular Cloud Cores.** *D. C. Lis, J. E. Carlstrom, & Jocelyn Keene.* 380, 429, 183-E7 (1991)
- High-Resolution Spectra of the 3.29 Micron Interstellar Emission Feature: A Summary.** *A. T. Tokunaga, K. Sellgren, R. G. Smith, T. Nagata, A. Sakata, & Y. Nakada.* 380, 452, 183-G8 (1991)
- Interstellar Photodissociation and Photoionization Rates.** *W. G. Robarge, D. Jones, S. Lepp, & A. Dalgarno.* 377, 287, 48-B1 (1991)
- Evolution of Dust Grains through a Hot Gaseous Halo.** *A. Ferrara, F. Ferrini, J. Franco, & B. Barsella.* 381, 137, 190-F9 (1991)

- Interstellar Solid CO: Polar and Nonpolar Interstellar Ices. *A. G. G. M. Tielens, A. T. Tokunaga, T. R. Geballe, & F. Baas.* 381, 181, 191-C5 (1991)
- Preliminary Spectral Observations of the Galaxy with a 7° Beam by the Cosmic Background Explorer (COBE). *E. L. Wright, J. C. Mather, C. L. Bennett, E. S. Cheng, R. A. Shafer, D. J. Fixsen, R. E. Eplee, Jr., R. B. Isaacman, S. M. Read, N. W. Boggess, S. Gulkis, M. G. Hauser, M. Janssen, T. Kelsall, P. M. Lubin, S. S. Meyer, S. H. Moseley, Jr., T. L. Murdoch, R. F. Silverberg, G. F. Smoot, R. Weiss, & D. T. Wilkinson.* 381, 200, 191-D12 (1991)
- Interstellar Environments Probed by Ca I Absorption and the Effects of Density-dependent Depletions. *Jason A. Cardelli, S. R. Federman, & V. V. Smith.* 381, L17, 194-C7 (1991)
- Radial Dust Density Profiles in Small Molecular Clouds. *João Lin Yun & Dan P. Clemens.* 381, 474, 196-E7 (1991)
- Diffuse Band Profiles in the Spectrum of HD 29647: Evidence for a Molecular Origin? *Theodore P. Snow & C. G. Seab.* 382, 189, 202-E7 (1991)
- 10 Micron Spectra of Protostars and the Solid Methanol Abundance. *W. A. Schutte, A. G. G. M. Tielens, & S. A. Sandford.* 382, 523, 208-A11 (1991)
- Hydrogenated Amorphous Carbon Grains and the 2175 Å Interstellar Hump. *Armando Blanco, Ezio Bussolati, Luigi Colangeli, Sergio Fonti, & John R. Stephens.* 382, L97, 211-E8 (1991)
- Constraints on the Optical Properties of Interstellar Dust in the Far-Ultraviolet: Voyager Observations of the Diffuse Sky Background. *Jayant Murthy, R. C. Henry, & J. B. Holberg.* 383, 198, 214-E1 (1991)
- 3.3 Micron Emission from Ultraviolet Excitation of Some Aromatic Molecules. *Jun Shan, Masako Suto, & L. C. Lee.* 383, 459, 218-A7 (1991)
- Infrared Dust and Millimeter-Wave Carbon Monoxide Emission in the Orion Region. *John Bally, William D. Langer, & Weihong Liu.* 383, 645, 222-C6 (1991)
- The Dusty Envelopes of FU Orionis Variables. *Scott J. Kenyon & Lee W. Hartmann.* 383, 664, 222-E1 (1991)
- A Model for the Infrared Emission from an OB Star Cluster Environment. *D. Leisawitz.* 77, 451, 51-B1 (1991)
- INTERSTELLAR: MAGNETIC FIELDS**
- Reversing the Axisymmetric ( $m = 0$ ) Magnetic Fields in the Milky Way. *J. P. Vallée.* 366, 450, 8-D9 (1991)
- Magnetic Flux Loss from Interstellar Clouds with Various Grain-Size Distributions. *Ryoichi Nishi, Takenori Nakano, & Toyoharu Umebayashi.* 368, 181, 25-C11 (1991)
- Polarimetric Mapping of Orion Using MILLIPOL: Magnetic Activity in BN/KL. *Robert W. Leach, Dan P. Clemens, Brian D. Kane, & Richard Barvainis.* 370, 257, 50-D1 (1991)
- Ambipolar Diffusion, Cloud Cores, and Star Formation: Two-dimensional, Cylindrically Symmetric Contraction. I. The Issues, Formulation of the Problem, and Method of Solution. *Telemachos Ch. Mouschovias & Scott A. Morton.* 371, 296, 63-G1 (1991)
- Thermal and Nonthermal Motions in Dense Cores. *P. C. Myers, E. F. Ladd, & G. A. Fuller.* 372, L95, 85-E9 (1991)
- Magnetic Braking, Ambipolar Diffusion, Cloud Cores, and Star Formation: Natural Length Scales and Protostellar Masses. *Telemachos Ch. Mouschovias.* 373, 169, 88-B3 (1991)
- On the Dispersion in Direction of Interstellar Polarization. *P. C. Myers & A. A. Goodman.* 373, 509, 94-C9 (1991)
- Molecular Hydrogen Polarization Images of OMC-1. *Michael G. Burton, N. R. Minchin, J. H. Hough, C. Aspin, D. J. Axon, & J. A. Bailey.* 375, 611, 120-C9 (1991)
- The Equilibria and Evolutions of Magnetized, Rotating, Isothermal Clouds. V. The Effect of the Toroidal Field. *Kohji Tomisaka.* 376, 190, 127-C11 (1991)
- Positron Annihilation in the Interstellar Medium. *Nidhal Guessoum, Reuven Ramaty, & Richard E. Lingenfelter.* 378, 170, 153-B4 (1991)
- Polarimetric Imaging of the Galactic Center at 12.4 Microns: The Detailed Magnetic Field Structure in the Northern Arm and East-West Bar. *David K. Aitken, Daniel Gezari, Craig H. Smith, Mark McCaughrean, & Patrick F. Roche.* 380, 419, 183-D10 (1991)
- Polarized Radio Emission from the Edge-on Spiral Galaxies NGC 891 and NGC 4565. *S. Sukumar & R. J. Allen.* 382, 100, 201-D1 (1991)
- INTERSTELLAR: MATTER**
- The Physical Properties of Giant Molecular Cloud Complexes in the Outer Galaxy: Implications for the Ratio of H<sub>2</sub> Column Density to <sup>12</sup>CO Intensity. *T. J. Sodroski.* 366, 95, 2-C1 (1991)
- Refractive Interstellar Scintillation and Millisecond Pulsar Timing. *Wayne Hu, Roger W. Romani, & Daniel R. Stinebring.* 366, L33, 6-D9 (1991)
- Stellar Lyman-Alpha Emission and the Local Interstellar Medium. *Wayne Landsman & Theodore Simon.* 366, L79, 11-D9 (1991)
- Thermal Instabilities in Proto-Globular Clusters Resulting from Time-dependent Potentials. *Stephen D. Murray & Douglas N. C. Lin.* 367, 149, 13-G6 (1991)
- Infrared Spectroscopy of T Tauri Stars. *C. Giovanardi, S. Gennari, A. Natta, & R. Stanga.* 367, 173, 14-B11 (1991)
- Limits on the Density of Neutral Gas within 100 Parsecs from Observations of the Soft X-Ray Background. *M. Juda, J. J. Bloch, B. C. Edwards, D. McCammon, W. T. Sanders, S. L. Snowden, & J. Zhang.* 367, 182, 14-C8 (1991)
- Ultraviolet Interstellar Lines in the Spectrum of π Scorpii Recorded at 2 Kilometers per Second Resolution. *Charles L. Joseph & Edward B. Jenkins.* 368, 201, 25-E9 (1991)
- The Dynamic Instability of Adiabatic Blast Waves. *Dongsu Ryu & Ethan T. Vishniac.* 368, 411, 30-B12 (1991)
- The Interstellar D<sub>1</sub> Line at High Resolution. *L. M. Hobbs & D. E. Wely.* 368, 426, 30-D1 (1991)
- Predicted Profiles of Ultraviolet Interstellar Absorption Lines. *D. E. Wely, L. M. Hobbs, & D. G. York.* 75, 425, 6-E5 (1991)
- Electron Densities and the Excitation of CN in Molecular Clouds. *John H. Black & Ewine F. van Dishoeck.* 369, L9, 40-B5 (1991)
- Is Interstellar Detection of Higher Members of the Linear Radicals C<sub>n</sub>CH and C<sub>n</sub>N Feasible? *F. Pauza, Y. Ellinger, & A. D. McLean.* 369, L13, 40-B11 (1991)
- Radio Recombination Lines from Diffuse Interstellar Gas in the Galaxy. *J. C. Cersosimo & J. S. Onello.* 370, 225, 50-A5 (1991)
- IRAS 23545+6508, a Dissociating Star: Prototype for a New Observational Class? *P. E. Dewdney, R. S. Roger, C. R. Purton, & W. H. McCutcheon.* 370, 243, 50-C1 (1991)
- High-Resolution Imaging of Brackett-γ and H<sub>2</sub> 1-0 S(1) Emission in the Seyfert Galaxy NGC 1068. *V. Rotaciuc, A. Krabbe, M. Cameron, S. Drapatz, R. Genzel, A. Sternberg, & J. W. V. Storey.* 370, L23, 53-D6 (1991)
- A 21 Centimeter Line Survey of a Region around Four Outer Galaxy Open Clusters. *D. Leisawitz & E. J. de Geus.* 75, 835, 13-A1 (1991)
- On the Thermal Stability of Slabs, Cylinders, and Spheres. *Miguel H. Ibáñez S., & Florencio P. Plachco M.* 370, 743, 57-F1 (1991)
- The Escape of Lyman-Alpha Radiation from a Multiphase Interstellar Medium. *David A. Neufeld.* 370, L85, 59-D13 (1991)
- Spatial Structure of the Interstellar Gas toward the Globular Cluster M22. *B. Bates & M. G. Comey.* 371, L37, 66-E7 (1991)
- Spectral Observations of the Extreme Ultraviolet Background. *Simon E. Labov & Stuart Bowyer.* 371, 810, 71-F1 (1991)
- Detection of Local Interstellar CO Absorption toward BL Lacertae. *Alan P. Marscher, Thomas M. Bania, & Zhong Wang.* 371, L77, 73-D7 (1991)
- Atomic Oxygen Fine-Structure Splittings with Tunable Far-Infrared Spectroscopy. *Lyndon R. Zink, Kenneth M. Evenson, Fusakazu Matsushima, Thomas Nelis, & Ruth L. Robinson.* 371, L85, 73-E3 (1991)
- VLA Observations of 21 Centimeter H I Absorption toward Cassiopeia A. *John H. Bieging, W. Miller Goss, & Eric M. Wilcots.* 75, 999, 16-F5 (1991)
- VLA and VLBI Angular Broadening Measurements: The Distribution of Interstellar Scattering at Low Galactic Latitudes. *A. L. Fey, S. R. Spangler, & J. M. Cordes.* 372, 132, 75-F1 (1991)
- Line Integrals of n<sub>e</sub> and n<sub>e</sub><sup>2</sup> at High Galactic Latitude. *R. J. Reynolds.* 372, L17, 79-C1 (1991)
- The Local Interstellar Medium toward the Center of Loop I. *Miriam Centurion & Giovanni Vladilo.* 372, 494, 82-A1 (1991)
- Thermal and Nonthermal Motions in Dense Cores. *P. C. Myers, E. F. Ladd, & G. A. Fuller.* 372, L95, 85-E9 (1991)

- Parsec-Scale Penetration of Ultraviolet Photons into Molecular Clouds: [C II] 158 Micron Mapping of W3, NGC 1977, and NGC 2023. *J. E. Howe, D. T. Jaffe, R. Genzel, & G. J. Stacey.* 373, 158, 88-A5 (1991)
- Magnetic Braking, Ambipolar Diffusion, Cloud Cores, and Star Formation: Natural Length Scales and Protostellar Masses. *Telamachos Ch. Mouschovias.* 373, 169, 88-B3 (1991)
- Microstructure-determined Pulsar Dispersion Measures and the Problem of Profile Alignment. *Timothy H. Hankins, Vera A. Izvekova, Valerii M. Malofeev, Joanna M. Rankin, Yuri P. Shitov, & Daniel R. Stinebring.* 373, L17, 91-C1 (1991)
- On the Dispersion in Direction of Interstellar Polarization. *P. C. Myers & A. A. Goodman.* 373, 509, 94-C9 (1991)
- Supernova Remnant Evolution in an Interstellar Medium with Evaporating Clouds. *Richard L. White & Knox S. Long.* 373, 543, 94-F7 (1991)
- The Interstellar Tunnel of Neutral-free Gas toward  $\beta$  Canis Majoris. *Barry Y. Welsh.* 373, 556, 94-G8 (1991)
- The Expansion of the Crab Nebula. *M. F. Bietenholz, P. P. Kronberg, D. E. Hogg, & A. S. Wilson.* 373, L59, 97-D5 (1991)
- Interstellar Grains within Interstellar Grains. *Thomas J. Bernatowicz, Sachiko Amari, Ernst K. Zinner, & Roy S. Lewis.* 373, L73, 97-E10 (1991)
- New Observations of the Gas Cloud Associated with the Quasar-Galaxy Pair 3C 232/NGC 3067. *John T. Stocke, James Case, Megan Donahue, J. Michael Shull, & Theodore P. Snow.* 374, 72, 98-G7 (1991)
- Continuum Emission at 1 Millimeter from the Elliptical Galaxy NGC 205. *Michel Fich & Paul Hodge.* 374, L17, 103-D7 (1991)
- Large-Scale [C II] 158 Micron Emission from the Galaxy. *Hiroshi Shibai, Haruyuki Okuda, Takao Nakagawa, Hideo Matsuhara, Toshinori Maihara, Kohei Mizutani, Yukiyasu Kobayashi, Norihisa Hiromoto, Tetsuo Nishimura, & Frank J. Low.* 374, 522, 105-F1 (1991)
- Observation of Neutral Hydrogen in the Globular Cluster NGC 2808. *D. J. Faulkner, Tania R. Scott, P. R. Wood, & Alan E. Wright.* 374, L45, 110-C6 (1991)
- Observations That Link Infrared Cirrus and Ultraviolet Extinction. *John A. Hackwell, James H. Hecht, & Mauricio Tapia.* 375, 163, 113-A9 (1991)
- Expansion of a Superbubble in a Uniform Magnetic Field. *Katia M. Ferrière, Mordecai-Mark Mac Low, & Ellen G. Zweibel.* 375, 239, 114-A4 (1991)
- The Influence of the Interface between the Heliosphere and the Local Interstellar Medium on the Penetration of the H Atoms to the Solar System. *V. B. Baranov, M. G. Lebedev, & Yu. G. Malama.* 375, 347, 115-C1 (1991)
- Interstellar Scattering Effects on the Detection of Narrow-Band Signals. *James M. Cordes & T. Joseph Lazio.* 376, 123, 126-D10 (1991)
- The Dissipation of Magnetohydrodynamic Turbulence Responsible for Interstellar Scintillation and the Heating of the Interstellar Medium. *Steven R. Spangler.* 376, 540, 133-B5 (1991)
- Isotopically Anomalous Ti in Presolar SiC from the Murchison Meteorite. *Trevor R. Ireland, Ernst K. Zinner, & Sachiko Amari.* 376, L53, 137-D7 (1991)
- First Results from the Goddard High-Resolution Spectrograph: The Galactic Halo and the Ly $\alpha$  Forest at Low Redshift in 3C 273. *Simon L. Morris, Ray J. Weymann, Blair D. Savage, & Ronald L. Gilliland.* 377, L21, 143-C11 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Resolved Velocity and Density Structure in the  $\beta$  Pictoris Circumstellar Gas. *A. Boggs, Frederick C. Bruhweiler, C. A. Grady, Dennis C. Ebbets, Yoji Kondo, L. M. Trafton, John C. Brandt, & S. R. Heap.* 377, L49, 143-F1 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Element Abundances as a Function of Velocity in the Neutral Gas toward  $\xi$  Persei. *Blair D. Savage, Jason A. Cardelli, Frederick C. Bruhweiler, Andrew M. Smith, Dennis C. Ebbets, & Kenneth R. Sembach.* 377, L53, 143-F6 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Elemental Abundances in the Diffuse Clouds toward  $\xi$  Persei. *Jason A. Cardelli, Blair D. Savage, Frederick C. Bruhweiler,*
- Andrew M. Smith, Dennis C. Ebbets, Kenneth R. Sembach, & Ulysses J. Sofia.* 377, L57, 143-F11 (1991)
- First Results from the Goddard High-Resolution Spectrograph: C I, S I, and CO toward  $\xi$  Persei and the Physical Conditions in Diffuse Clouds. *Andrew M. Smith, Frederick C. Bruhweiler, David L. Lambert, Blair D. Savage, Jason A. Cardelli, Dennis C. Ebbets, Cheng-Hsuan Lyu, & Yaron Sheffer.* 377, L61, 143-G1 (1991)
- Shape and Clustering Effects on the Optical Properties of Amorphous Carbon. *François Rouleau & P. G. Martin.* 377, 526, 146-C3 (1991)
- The Metallicity of RR Lyrae Stars in Baade's Window. *Alistair R. Walker & Donald M. Terndrup.* 378, 119, 152-D13 (1991)
- Galactic Structure from the Spacelab Infrared Telescope. II. Luminosity Models of the Milky Way. *S. M. Kent, T. M. Dame, & G. Fazio.* 378, 131, 152-F1 (1991)
- Positron Annihilation in the Interstellar Medium. *Nidhal Guessoum, Reuven Ramaty, & Richard E. Lingefelter.* 378, 170, 153-B4 (1991)
- Variable Interstellar Absorption toward HD 72127A. II. 1981–1988. *L. M. Hobbs, R. Ferlet, D. E. Welty, & G. Wallerstein.* 378, 586, 159-F1 (1991)
- The Analysis of Apparent Optical Depth Profiles for Interstellar Absorption Lines. *Blair D. Savage & Kenneth R. Sembach.* 379, 245, 166-B5 (1991)
- Atomic Data for Resonance Absorption Lines. I. Wavelengths Longward of the Lyman Limit. *Donald C. Morton.* 379, 119, 45-B1 (1991)
- Ionized Carbon in the Large Magellanic Cloud. *R. T. Boreiko & A. L. Betz.* 380, L27, 181-D9 (1991)
- Interaction of Mass Lost in Globular Clusters with the Halo Medium. *D. J. Faulkner & Graeme H. Smith.* 380, 441, 183-F7 (1991)
- Probing the Galactic Halo along the 3C 273 Sight Line Using IUE. *Geoffrey S. Burks, Donald G. York, J. Chris Blades, Ralph C. Bohlin, & Willem Wamsteker.* 381, 55, 189-F5 (1991)
- Interstellar Solid CO: Polar and Nonpolar Interstellar Ices. *A. G. G. M. Tielens, A. T. Tokunaga, T. R. Geballe, & F. Baas.* 381, 181, 191-C5 (1991)
- Preliminary Spectral Observations of the Galaxy with a 7 $\sigma$  Beam by the Cosmic Background Explorer (COBE). *E. L. Wright, J. C. Mather, C. L. Bennett, E. S. Cheng, R. A. Shafer, D. J. Fixsen, R. E. Eplee, Jr., R. B. Isaacman, S. M. Read, N. W. Boggess, S. Gulkis, M. G. Hauser, M. Janssen, T. Kelsall, P. M. Lubin, S. S. Meyer, S. H. Moseley, Jr., T. L. Murdoch, R. F. Silverberg, G. F. Smoot, R. Weiss, & D. T. Wilkinson.* 381, 200, 191-D12 (1991)
- Interstellar Environments Probed by Ca I Absorption and the Effects of Density-dependent Depletions. *Jason A. Cardelli, S. R. Federman, & V. V. Smith.* 381, L17, 194-C7 (1991)
- Further High-Resolution Na I Observations of the Local Interstellar Medium. *B. Y. Welsh, P. W. Vedder, J. V. Vallerga, & N. Craig.* 381, 462, 196-D7 (1991)
- The Galactic Center Radio Source Shines below the Compton Limit. *C. R. Gwinn, R. M. Danen, J. Middleditch, L. M. Ozernoy, & T. Kh. Tran.* 381, L43, 199-B7 (1991)
- H I Absorption Measurements toward 15 Pulsars and the Radial Distribution of Diffuse Ionized Gas in the Galaxy. *D. A. Frail, J. M. Cordes, T. H. Hankins, & J. M. Weisberg.* 382, 168, 202-C10 (1991)
- Vertical Distribution and Support of Galactic H I. *Felix J. Lockman & Curtis S. Gehman.* 382, 182, 202-D12 (1991)
- Diffuse Band Profiles in the Spectrum of HD 29647: Evidence for a Molecular Origin? *Theodore P. Snow & C. G. Seab.* 382, 189, 202-E7 (1991)
- The Diffuse Interstellar Bands. VIII. New Features between 6000 and 8650 Å. *G. H. Herbig & K. D. Leka.* 382, 193, 202-E12 (1991)
- A Survey of H I 21 Centimeter Emission Lines toward Supernova Remnants. *Bon-Chul Koo & Carl Heiles.* 382, 204, 202-F11 (1991)
- Time Variability of Pulsar Dispersion Measures. *J. A. Phillips & A. Wolszczan.* 382, L27, 205-D1 (1991)
- The Optical Depth of the 158 Micron [C II] Line: Detection of the  $F = 1 \rightarrow 0$  [C II] Hyperfine-Structure Component. *G. J. Stacey, C. H. Townes, A. Poglitsch, S. C. Madden, J. M. Jackson, E. Herrmann, R. Genzel, & N. Geis.* 382, L37, 205-E1 (1991)
- s-Process Ba, Nd, and Sm in Presolar SiC from the Murchison Meteorite. *Ernst Zinner, Sachiko Amari, & Roy S. Lewis.* 382, L47, 205-E11 (1991)

- A Nearly Unipolar CO Outflow from the HH 46-47 System. *Lawrence M. Chernin & Colin R. Masson.* 382, L93, 211-E3 (1991)
- A Complete CO Survey of M31. *E. Koper, T. M. Dame, F. P. Israel, & P. Thaddeus.* 383, L11, 219-B7 (1991)
- Interstellar Gas Phase Abundance of Carbon, Oxygen, Nitrogen, Copper, Gallium, Germanium, and Krypton toward  $\zeta$  Ophiuchi. *Jason A. Cardelli, Blair D. Savage, & Dennis C. Ebbets.* 383, L23, 219-D1 (1991)
- Magnetized Supernova Remnants with Cosmic Rays. *Katia M. Ferrière & Ellen G. Zweibel.* 383, 602, 221-F11 (1991)
- Observations of Ca II Absorption along the Nearly Parallel Lines of Sight toward 3C 273 and SN 1991T. *David M. Meyer & Katherine C. Roth.* 383, L41, 226-B11 (1991)
- INTERSTELLAR: MOLECULES**
- The Physical Properties of Giant Molecular Cloud Complexes in the Outer Galaxy: Implications for the Ratio of H<sub>2</sub> Column Density to <sup>12</sup>CO Intensity. *T. J. Sodroski.* 366, 95, 2-C1 (1991)
- The *In Situ* Formation of Large Molecules in Dense Interstellar Clouds. *Eric Herbst.* 366, 133, 2-F4 (1991)
- CO  $J = 3 \rightarrow 2$  Observations of Translucent and High-Latitude Molecular Clouds. *Ewine F. van Dishoeck, John H. Black, T. G. Phillips, & R. Gredel.* 366, 141, 2-G1 (1991)
- Abundances of Hydrogen Sulfide in Star-forming Regions. *Y. C. Minh, L. M. Ziurys, W. M. Irvine, & D. McGonagle.* 366, 192, 3-D9 (1991)
- Dust and Gas in the Core of Arp 220 (IC 4553). *N. Z. Scoville, A. I. Sargent, D. B. Sanders, & B. T. Soifer.* 366, L5, 6-A13 (1991)
- Giant Molecular Clouds and the CO-to-H<sub>2</sub> Conversion Factor in IC 10. *Christine D. Wilson & I. Neill Reid.* 366, L11, 6-B7 (1991)
- The Star-forming Disk and CO Bar in M101. *Jeffrey D. P. Kenney, Nick Z. Scoville, & Christine D. Wilson.* 366, 432, 8-C1 (1991)
- Warm Neutral Halos around Molecular Clouds. III. Interpretation of H I and CO  $J = 1-0$  Data. *B-G Andersson, Peter G. Wannier, & Mark Morris.* 366, 464, 8-F1 (1991)
- A Spectroscopic Study of the DR 21 Outflow Source. II. The Vibrational H<sub>2</sub> Line Emission. *R. P. Garden, T. R. Geballe, I. Gatley, & D. Nadeau.* 366, 474, 8-G1 (1991)
- Water Vapor in the Orion Molecular Cloud. *R. F. Knacke & H. P. Larson.* 367, 162, 14-A10 (1991)
- A Search for vibrationally excited H<sub>2</sub>O at 68 GHz. *S. J. Petuchowski & C. L. Bennett.* 367, 168, 14-B4 (1991)
- Infrared Spectroscopy of T Tauri Stars. *C. Giovannardi, S. Gennari, A. Natta, & R. Stanga.* 367, 173, 14-B11 (1991)
- OH Emission and the Nature of Minkowski's Footprint (M1-92). *E. R. Sequist, René Plume, & L. E. Davis.* 367, 200, 14-E5 (1991)
- Detection of <sup>13</sup>C Isotopomers of HC<sub>5</sub>N ( $J = 9-8$ ) in the Circumstellar Envelope of IRC +10216. *M. B. Bell & P. A. Feldman.* 367, L33, 17-E8 (1991)
- Theoretical Determination of the Spectroscopic Constants of the MgC Molecule. *Marcos A. Castro, Sylvio Canuto, & Florian Müller-Plathe.* 367, L69, 22-D3 (1991)
- A <sup>12</sup>CO Survey of the Small Magellanic Cloud. *M. Rubio, G. Garay, J. Montani, & P. Thaddeus.* 368, 173, 25-C1 (1991)
- Excitation of Millimeter and Submillimeter Water Masers. *David A. Neufeld & Gary J. Melnick.* 368, 215, 25-F11 (1991)
- CO Excitation and H<sub>2</sub> Masses of Infrared-luminous Galaxies. *Simon J. E. Radford, P. M. Solomon, & D. Downes.* 368, L15, 28-C7 (1991)
- The Millimeter-Wave Spectrum of Highly vibrationally excited SiO. *R. Mollaaghatababa, C. A. Gottlieb, J. M. Vrtilek, & P. Thaddeus.* 368, L19, 28-D1 (1991)
- An Unbiased Survey for Dense Cores in the Lynds 1630 Molecular Cloud. *Elizabeth A. Lada, John Bally, & Antony A. Stark.* 368, 432, 30-D9 (1991)
- The Structure and Kinematics of Bipolar Outflows: Observations and Models of the Monoceros R2 Outflow. *Barry A. Meyers-Rice & Charles J. Lada.* 368, 445, 30-E10 (1991)
- Astronomical Detection of H<sub>2</sub>CCC. *J. Cernicharo, C. A. Gottlieb, M. Guélin, T. C. Killian, G. Paubert, P. Thaddeus, & J. M. Vrtilek.* 368, L39, 35-C7 (1991)
- Astronomical Detection of H<sub>2</sub>CCCC. *J. Cernicharo, C. A. Gottlieb, M. Guélin, T. C. Killian, P. Thaddeus, & J. M. Vrtilek.* 368, L43, 35-C11 (1991)
- The Formation of Oxygen-containing Organic Molecules in the Orion Compact Ridge. *T. J. Millar, Eric Herbst, & S. B. Charnley.* 369, 147, 37-F11 (1991)
- High-Density Gas in the Core of the Sagittarius B2 Molecular Cloud. *Dariusz C. Lis & Paul F. Goldsmith.* 369, 157, 37-G11 (1991)
- Fossil DCN in Orion-KL. *Jeffrey G. Mangum, Richard L. Plambeck, & Alwyn Wootten.* 369, 169, 38-A11 (1991)
- Electron Densities and the Excitation of CN in Molecular Clouds. *John H. Black & Ewine F. van Dishoeck.* 369, L9, 40-B5 (1991)
- Is Interstellar Detection of Higher Members of the Linear Radicals C<sub>n</sub>CH and C<sub>n</sub>N Feasible? *F. Pauzat, Y. Ellinger, & A. D. McLean.* 369, L13, 40-B11 (1991)
- Observations of <sup>12</sup>CO and <sup>13</sup>CO  $J = 9-8$  in Galactic Molecular Clouds. *R. T. Boreiko & A. L. Betz.* 369, 382, 42-E1 (1991)
- Bow Shock Models of Ultracompact H II Regions. *Mordechai-Mark Mac Low, Dave Van Buren, Douglas O. S. Wood, & Ed Churchwell.* 369, 395, 42-F1 (1991)
- High-Resolution CO Observations of Luminous Infrared Galaxies with Large  $L_{\text{CO}}/L_B$  Ratios: IRAS 10173+0828, Zw 049.057, IRAS 17208-0014. *P. Planesas, I. F. Mirabel, & D. B. Sanders.* 370, 172, 49-C5 (1991)
- OB Star Formation and H I Production in Molecular Clouds in M33. *Christine D. Wilson & Nick Scoville.* 370, 184, 49-D11 (1991)
- Molecular Hydrogen in the Vicinity of NGC 7538 IRS 1 and IRS 2: Temperature and Ortho-to-Para Ratio. *Susan Hoban, Dennis C. Reuter, Michael J. Mumma, & Alex D. Storrs.* 370, 228, 50-A10 (1991)
- Dust and Molecular Properties of the Low-Opacity Cloud Lynds 1563. *Frank O. Clark, R. J. Laureis, & Lauri L. Wardell.* 370, 237, 50-B7 (1991)
- IRAS 23545+6508, a Dissociating Star: Prototype for a New Observational Class? *P. E. Dewdney, R. S. Roger, C. R. Purton, & W. H. McCutcheon.* 370, 243, 50-C1 (1991)
- Fluctuations in Astronomical Masers. *Moshe Elitzur.* 370, L45, 53-F6 (1991)
- Far-Infrared Fourier Transform Spectroscopy of <sup>12</sup>C<sup>18</sup>O. *P. De Natale, M. Inguscio, C. Rois Orza, & L. R. Zink.* 370, L53, 53-G5 (1991)
- Bok Globules and Small Molecular Clouds: Deep IRAS Photometry and <sup>12</sup>CO Spectroscopy. *Dan P. Clemens, João Lin Yun, & Mark H. Heyer.* 75, 877, 13-E1 (1991)
- Protostellar Condensations in the Core of NGC 2024. *D. C. Lis, J. E. Carlstrom, & T. G. Phillips.* 370, 583, 55-F5 (1991)
- N<sub>2</sub>H<sup>+</sup> in Orion: Chemical Clues to the Dynamics of the Quiescent Gas. *M. Womack, L. M. Ziurys, & S. Wyckoff.* 370, L99, 59-F1 (1991)
- The Spectral Signatures of Collapse and Outflow around Young Stars. *E. R. Keto.* 371, 163, 62-B3 (1991)
- A 2.2 Micron Survey in the L1630 Molecular Cloud. *Elizabeth A. Lada, D. L. DePoy, Neal J. Evans II, & Ian Gailey.* 371, 171, 62-C1 (1991)
- An Extremely High Velocity CO Outflow from NGC 7538 IRS 9. *George F. Mitchell & Tatsuhiko I. Hasegawa.* 371, L33, 66-E1 (1991)
- Laboratory Detection of HC<sub>9</sub>N Using a Fourier Transform Microwave Spectrometer. *Minoru Iida, Yasuhiro Ohshima, & Yasuki Endo.* 371, L45, 66-F7 (1991)
- Detection of CO Emission in the Elliptical Galaxies NGC 3265 and NGC 5666. *M. A. Gordon.* 371, 563, 68-E1 (1991)
- The Temperature of Large Dust Grains in Molecular Clouds. *F. O. Clark, R. J. Laureis, & T. Prusti.* 371, 602, 69-A7 (1991)
- The Interstellar C-H Stretching Band near 3.4 Microns: Constraints on the Composition of Organic Material in the Diffuse Interstellar Medium. *S. A. Sandford, L. J. Allamandola, A. G. G. M. Tielens, K. Sellgren, M. Tapia, & Y. Pendleton.* 371, 607, 69-B1 (1991)
- Detection of Local Interstellar CO Absorption toward BL Lacertae. *Alan P. Marscher, Thomas M. Bania, & Zhong Wang.* 371, L77, 73-D7 (1991)
- Warm Neutral Halos around Molecular Clouds. II. H I and CO ( $J = 1-0$ ) Observations. *Peter G. Wannier, B-G Andersson, Mark Morris, & Steven M. Lichten.* 75, 987, 16-B1 (1991)
- The Molecular Interstellar Medium and the Near-Infrared Continuum of the Barred LINER NGC 6764. *A. Eckart, M. Cameron, J. M. Jackson, R. Genzel, A. I. Harris, W. Wild, & H. Zinnecker.* 372, 67, 74-G9 (1991)

- Molecular Hydrogen Formation by Excited Atom Radiative Association. *William B. Latter & John H. Black.* 372, 161, 76-A4 (1991)
- The Mid-Infrared Spectrum of the Carbon Star HD 38218 and Its Possible Relation to Polycyclic Aromatic Hydrocarbons. *Richard H. Buss, Jr., A. G. G. M. Tielens, & Theodore P. Snow.* 372, 281, 77-D8 (1991)
- The H<sub>2</sub> Line Profiles in the Cygnus Loop: Evidence for J-Shocks with Magnetic Precursors. *James R. Graham, Gillian S. Wright, & T. R. Geballe.* 372, L21, 79-C7 (1991)
- Detection of Low-J Pure-Rotational Emission from H<sub>2</sub> in the Orion Bar Region: Evidence for Small-Scale Clumpiness. *Parvinder S. Parmar, John H. Lacy, & Jeffrey M. Achtermann.* 372, L25, 79-D1 (1991)
- Molecular Outflows in the L1641 Region of Orion. *James A. Morgan & John Bally.* 372, 505, 82-B1 (1991)
- CS Multitransitional Studies of Density Distribution in Star-forming Regions. I. The NGC 2071 Region. *Shudong Zhou, Neal J. Evans II, Rolf Güsten, Lee G. Mundy, & Marc L. Kutner.* 372, 518, 82-C1 (1991)
- The Extinction to the H<sub>2</sub> Line Emission in the DR 21 Outflow Source. *Daniel Nadeau, Martin Riopel, & T. R. Geballe.* 372, L103, 85-F5 (1991)
- The Gas-Phase Chemistry of Organic Molecules in Interstellar Clouds with Dynamical Mixing. *J.-P. Chièze, G. Pineau des Forets, & Eric Herbst.* 373, 110, 87-D4 (1991)
- Dynamical Evolution and Molecular Abundances of Interstellar Clouds. *Sheo S. Prasad, Karen R. Heere, & Shankar P. Tarafdar.* 373, 123, 87-E5 (1991)
- A Millimeter-Wave Line Study of L1287: A Case of Induced Star Formation by Stellar Wind Compression? *Ji Yang, Tomofumi Umemoto, Takahiro Iwata, & Yasuo Fukui.* 373, 137, 87-F7 (1991)
- VLBI Observations of Interstellar Ammonia Masers. *Preeti Pratap, Karl M. Menten, Mark J. Reid, James M. Moran, & C. Malcolm Walmsley.* 373, L13, 91-B12 (1991)
- A Second Outflow from L1551/IRS 5? *G. H. Moriarty-Schieven & P. G. Wannier.* 373, L23, 91-C8 (1991)
- Collisional Pumping of H<sub>2</sub>O Masers in Star-forming Regions. *Nikolaas D. Kylafis & Colin A. Norman.* 373, 525, 94-D13 (1991)
- Nitric Oxide in Star-forming Regions: Further Evidence for Interstellar N-O Bonds. *L. M. Ziurys, D. McGonagle, Y. Minh, & W. M. Irvine.* 373, 535, 94-E11 (1991)
- The Dense, Inner Part of the Protostellar Disk: Protostellar Candidates in GGD 27 IRS. *Takuya Yamashita, Yasuhiro Murata, Ryohji Kawabe, Norio Kaifu, & Motohide Tamura.* 373, 560, 95-A1 (1991)
- Variability of Interstellar Hydroxyl Masers. *Andrew W. Clegg & James M. Cordes.* 374, 150, 99-G11 (1991)
- Probing the Core of Cepheus A: Millimeter and Submillimeter Observations. *G. H. Moriarty-Schieven, R. L. Snell, & V. A. Hughes.* 374, 169, 100-B3 (1991)
- Observations of HCO<sup>+</sup> in B335. *Tatsuhiko I. Hasegawa, C. Rogers, & Saeko Suzuki Hayashi.* 374, 177, 100-C1 (1991)
- Calculations Concerning the Reaction C + H<sub>3</sub><sup>+</sup> → CH<sup>+</sup> + H<sub>2</sub>. *D. Talbi, D. J. DeFrees, D. A. Egolf, & Eric Herbst.* 374, 390, 103-A1 (1991)
- Infrared Fluorescence of H<sub>2</sub> in NGC 6240: A Starburst Origin for the H<sub>2</sub> Luminosity. *Masuo Tanaka, Tetsuo Hasegawa, & Ian Gatley.* 374, 516, 105-E9 (1991)
- A Spectroscopic Study of the DR 21 Outflow Source. III. The CO Line Emission. *R. P. Garden, M. Hayashi, I. Gatley, T. Hasegawa, & N. Kaifu.* 374, 540, 105-G11 (1991)
- A Molecular Line Survey of Sagittarius B2 and Orion-KL from 70 to 115 GHz. II. Analysis of the Data. *B. E. Turner.* 76, 617, 33-D1 (1991)
- Formaldehyde in Envelopes of Interstellar Dark Clouds. *S. R. Federman & M. Allen.* 375, 157, 113-A1 (1991)
- A Simulation of the Collapse and Fragmentation of Cooling Molecular Clouds. *Joe J. Monaghan & John C. Lattanzio.* 375, 177, 113-C1 (1991)
- Molecular Hydrogen Polarization Images of OMC-1. *Michael G. Burton, N. R. Minchin, J. H. Hough, C. Aspin, D. J. Axon, & J. A. Bailey.* 375, 611, 120-C9 (1991)
- The Smoothness of CO Line Profiles in Orion: Implications for Clumpiness. *Jan A. Tauber, Paul F. Goldsmith, & Robert L. Dickman.* 375, 635, 120-E7 (1991)
- Probing Shock Models of CH<sup>+</sup> Formation. *Isabel Hawkins & Nahide Craig.* 375, 642, 120-F1 (1991)
- Anatomy of the Barnard 5 Core. *G. A. Fuller, P. C. Myers, W. J. Welch, P. F. Goldsmith, W. D. Langer, B. G. Campbell, S. Guilloteau, & R. W. Wilson.* 376, 135, 126-E10 (1991)
- Collisional Excitation of Formaldehyde in "Hot" Interstellar Molecular Regions. *Sheldon Green.* 76, 979, 38-E3 (1991)
- CO (3→2) Mapping and Gas Excitation in the Core of M82. *R. P. J. Tilanus, L. J. Tacconi, E. C. Sutton, S. Zhou, D. B. Sanders, C. G. Wynn-Williams, K. Y. Lo, & S. A. Stephens.* 376, 500, 132-E13 (1991)
- Can Phase Space Theory Reproduce Experimental Neutral Product Branching Ratios for Dissociative Recombination Reactions? *E. T. Galloway & Eric Herbst.* 376, 531, 133-A8 (1991)
- Discovery of Interstellar Methane: Observations of Gaseous and Solid CH<sub>4</sub> Absorption toward Young Stars in Molecular Clouds. *J. H. Lacy, J. S. Carr, Neal J. Evans II, F. Baas, J. M. Achtermann, & J. F. Arens.* 376, 556, 133-C9 (1991)
- Dense Cores in Dark Clouds. VI. Shapes. *P. C. Myers, G. A. Fuller, A. A. Goodman, & P. J. Benson.* 376, 561, 133-D1 (1991)
- Observations and Chemistry of Interstellar Refractory Elements. *B. E. Turner.* 376, 573, 133-E1 (1991)
- NGC 7538 IRS 1: Subarcsecond Resolution Recombination Line and <sup>15</sup>NH<sub>3</sub> Maser Observations. *R. A. Gaume, K. J. Johnston, H. A. Nguyen, T. L. Wilson, H. R. Dickel, W. M. Goss, & M. C. H. Wright.* 376, 608, 133-G12 (1991)
- Discovery of Interstellar NH. *David M. Meyer & Katherine C. Roth.* 376, L49, 137-D1 (1991)
- Theoretical Studies of the Absorption Spectra of Polycyclic Aromatic Hydrocarbons. *Sylvio Canuto, Michael C. Zerner, & Geerd H. F. Diercksen.* 377, 150, 139-G3 (1991)
- Energy Deposition by X-Ray Photoelectrons into Interstellar Molecular Clouds. *G. Mark Voit.* 377, 158, 140-A1 (1991)
- Water in Dense Molecular Clouds. *P. G. Wannier, L. Pagani, T. B. H. Kuiper, M. A. Frerking, S. Gulkin, P. Encrenaz, H. M. Pickett, A. Lecacheux, & W. J. Wilson.* 377, 171, 140-B1 (1991)
- Large Molecule Production by Mass-losing Carbon Stars: The Primary Source of Interstellar Polycyclic Aromatic Hydrocarbons? *William B. Latter.* 377, 187, 140-C5 (1991)
- Low-Density Photodissociation Regions. *David J. Hollenbach, Takamasa Takahashi, & A. G. G. M. Tielens.* 377, 192, 140-C11 (1991)
- First Results from the Goddard High-Resolution Spectrograph: C I, S I, and CO toward ε Persei and the Physical Conditions in Diffuse Clouds. *Andrew M. Smith, Frederick C. Bruhweiler, David L. Lambert, Blair D. Savage, Jason A. Cardelli, Dennis C. Ebets, Cheng-Hsuan Lyu, & Yaron Sheffer.* 377, L61, 143-G1 (1991)
- Molecular Observations of the L723 Region: Interaction between the Clumpy Outflow and the Gaseous Core? *Saeko S. Hayashi, Tetsuo Hasegawa, & Norio Kaifu.* 377, 492, 145-G5 (1991)
- On Molecular Cloud Scaling Laws and Star Formation. *R. N. Henriksen.* 377, 500, 146-A1 (1991)
- U-shaped Outflow in the Lynds 1221 Dark Cloud: An Example of Interaction of Outflows with Ambient Molecular Clouds. *Tomofumi Umemoto, Naomi Hirano, Osamu Kameya, Yasuo Fukui, Nario Kuno, & Keiyo Takakubo.* 377, 510, 146-A13 (1991)
- The Dense Molecular Envelope around the Compact H II Region G5.89–0.39 (W28 A2). *Yolanda Gómez, Luis F. Rodríguez, Guido Garay, & James M. Moran.* 377, 519, 146-B9 (1991)
- Polycyclic Aromatic Hydrocarbon Optical Properties and Contribution to the Acceleration of Stellar Outflows. *Isabelle Cherchneff, John R. Barker, & Alexander G. G. M. Tielens.* 377, 541, 146-D6 (1991)
- Kinematical Models of Maser Shells Formed by Aspherical Stellar Outflows (U Orionis; OH 231.8+4.2; Orion-IRc2). *P. F. Bowers.* 76, 1099, 40-G9 (1991)
- A Finger-like Extension of the 20 Kilometer per Second Cloud toward the Galactic Center. *Sachiko K. Okumura, Masato Ishiguro, Edward B. Fomalont, Tetsuo Hasegawa, Takashi Kasuga, Koh-Ichiro*

- Morita, Ryohei Kawabe, & Hideyuki Kobayashi.** 378, 127, 152-E9 (1991)
- Cloud Formation by Combined Instabilities in Galactic Gas Layers: Evidence for a  $Q$  Threshold in the Fragmentation of Shearing Wavelets.** Bruce G. Elmegreen. 378, 139, 152-F11 (1991)
- Interstellar  $^{12}\text{C}/^{13}\text{C}$  Ratio Revisited.** Philippe Crane, Dennis J. Hegyi, & David L. Lambert. 378, 181, 153-C1 (1991)
- The Edges of Molecular Clouds: Fractal Boundaries and Density Structure.** E. Falgarone, T. G. Phillips, & C. K. Walker. 378, 186, 153-C8 (1991)
- Partially Dissociative Jump Shocks in Molecular Hydrogen.** C. A. Chang & P. G. Martin. 378, 202, 153-E1 (1991)
- The Velocity Dispersion of Giant Molecular Clouds. II. Mathematical and Numerical Refinements.** Charles F. Gammie, Jeremiah P. Ostriker, & Chanda J. Jog. 378, 565, 159-D5 (1991)
- Synthesis Imaging of the DR 21(OH) Cluster. I. Dust Continuum and  $\text{C}^{18}\text{O}$  Emission.** Jeffrey G. Mangum, Alwyn Wootten, & Lee G. Mundy. 378, 576, 159-E3 (1991)
- Molecular Gas in Elliptical Galaxies.** Joanna F. Lees, G. R. Knapp, Michael P. Rupen, & T. G. Phillips. 379, 177, 165-B11 (1991)
- SiS in Outflow Regions: More High-Temperature Silicon Chemistry.** L. M. Ziurys. 379, 260, 166-C7 (1991)
- The Interstellar  $^{12}\text{CN}/^{13}\text{CN}$  Ratio toward  $\zeta$  Persei.** Mary Elizabeth Kaiser, Isabel Hawkins, & Edward L. Wright. 379, 267, 166-D1 (1991)
- Millimeter- and Submillimeter-Wave Spectrum of Highly Excited States of Water.** J. C. Pearson, Todd Anderson, Eric Herbst, Frank C. De Lucia, & Paul Helminger. 379, L41, 169-D12 (1991)
- Star Counts and Carbon Monoxide Observations of Maddalena's Cloud.** Youngung Lee, Ronald L. Snell, & Robert L. Dickman. 379, 639, 172-E11 (1991)
- Location of the Thermal Continuum Source Sagittarius D.** Dariusz C. Lis. 379, L53, 175-B10 (1991)
- Desorption of Large Molecules from Grains in Dense Interstellar Clouds.** R. E. Johnson, V. Pirronello, B. Sundqvist, & B. Donn. 379, L75, 175-D12 (1991)
- Ionized Carbon in the Large Magellanic Cloud.** R. T. Boreiko & A. L. Betz. 380, L27, 181-D9 (1991)
- Detection of a New Carbon-Chain Molecule, CCO.** Masatoshi Ohishi, Hiroko Suzuki, Shin-ichi Ishikawa, Chikashi Yamada, Hideki Kanamori, William M. Irvine, Ronald D. Brown, Peter D. Godfrey, & Norio Kaiju. 380, L39, 181-E11 (1991)
- On the State of the Emitter of the 3.3 Micron Unidentified Infrared Band: Absorption Spectroscopy of Polycyclic Aromatic Hydrocarbon Species.** Gregory C. Flickinger, Thomas J. Wdowiak, & Percy L. Gómez. 380, L43, 181-F1 (1991)
- Molecular Gas Excitation in NGC 253.** W. F. Wall, D. T. Jaffe, F. P. Israel, & F. N. Bash. 380, 384, 183-A11 (1991)
- Star Formation and the Molecular Content of IC 342.** Leslie J. Sage & P. M. Solomon. 380, 392, 183-B7 (1991)
- Millimeter Continuum Observations of Galactic Center Giant Molecular Cloud Cores.** D. C. Lis, J. E. Carlstrom, & Jocelyn Keene. 380, 429, 183-E7 (1991)
- CO  $J = 3-2$  and  $J = 2-1$  Observations of NGC 7027.** P. A. Jaminet, W. C. Danchi, E. C. Sutton, A. P. G. Russell, Göran Sandell, J. H. Bieging, & D. Wilner. 380, 461, 184-A4 (1991)
- The Discovery of a New, Very Strong, and Widespread Interstellar Methanol Maser Line.** Karl M. Menten. 380, L75, 188-E1 (1991)
- Molecular Line Survey of Sagittarius B2(M) from 330 to 355 GHz and Comparison with Sagittarius B2(N).** E. C. Sutton, P. A. Jaminet, W. C. Danchi, & Geoffrey A. Blake. 77, 255, 47-F1 (1991)
- Interstellar Photodissociation and Photoionization Rates.** W. G. Robarge, D. Jones, S. Lepp, & A. Dalgarno. 77, 287, 48-B1 (1991)
- Possible Deflection of a Jet by Molecular Clouds in NGC 4258.** R. L. Plante, K. Y. Lo, Jean-René Roy, Pierre Martin, & Louis Noreau. 381, 110, 190-D4 (1991)
- Orbit Crowding of Molecular Gas at a Bar-Spiral Arm Transition Zone in M83.** Jeffrey D. P. Kenney & Steven D. Lord. 381, 118, 190-D13 (1991)
- A Molecular Gas Ridge Offset from the Dust Lane in a Spiral Arm of M83.** Steven D. Lord & Jeffrey D. P. Kenney. 381, 130, 190-E13 (1991)
- $\text{H}_2\text{CO}$  in IC 443G: Unusual Excitation and a Diagnostic of Shock Astrochemistry.** B. E. Turner & D. A. Lubowich. 381, 173, 191-B9 (1991)
- Preliminary Spectral Observations of the Galaxy with a 7° Beam by the Cosmic Background Explorer (COBE).** E. L. Wright, J. C. Mather, C. L. Bennett, E. S. Cheng, R. A. Shafer, D. J. Fixsen, R. E. Eplee, Jr., R. B. Isaacsman, S. M. Read, N. W. Boggess, S. Gulikis, M. G. Hauser, M. Janssen, T. Kelsall, P. M. Lubin, S. S. Meyer, S. H. Moseley, Jr., T. L. Murdoch, R. F. Silverberg, G. E. Smoot, R. Weiss, & D. T. Wilkinson. 381, 200, 191-D12 (1991)
- Infrared Spectroscopy of Cygnus A: Implications for the Obscured Active Nucleus.** Marin J. Ward, Philip R. Blanco, Andrew S. Wilson, & Minoru Nishida. 382, 115, 201-E11 (1991)
- The Relationship between the Carbon Monoxide Intensity and the Radio Continuum Emission in Spiral Galaxies.** David S. Adler, Ronald J. Allen, & K. Y. Lo. 382, 475, 207-D12 (1991)
- 10 Micron Spectra of Protostars and the Solid Methanol Abundance.** W. A. Schutte, A. G. G. M. Tielens, & S. A. Sandford. 382, 523, 208-A11 (1991)
- Molecular Line Emission Models of Herbig-Haro Objects. I.  $\text{H}_2$  Emission.** Mark G. Wolfe & Arieh Königl. 383, 205, 214-E9 (1991)
- 3.3 Micron Emission from Ultraviolet Excitation of Some Aromatic Molecules.** Jun Shan, Masako Suto, & L. C. Lee. 383, 459, 218-A7 (1991)
- A Complete CO Survey of M31.** E. Koper, T. M. Dame, F. P. Israel, & P. Thaddeus. 383, L11, 219-B7 (1991)
- Gravitational Fragmentation: A Comparison with W49A.** Eric R. Keto, John C. Lattanzio, & Joe J. Monaghan. 383, 639, 222-B12 (1991)
- Infrared Dust and Millimeter-Wave Carbon Monoxide Emission in the Orion Region.** John Bally, William D. Langer, & Weihong Liu. 383, 645, 222-C6 (1991)
- Infrared Molecular Spectroscopy toward the Orion  $\text{Irc2}$  and  $\text{Irc7}$  Sources: A New Probe of Physical Conditions and Abundances in Molecular Clouds.** Neal J. Evans II, J. H. Lacy, & John S. Carr. 383, 674, 222-E13 (1991)
- X Marks the Spot: Distribution and Excitation of Unidentified Molecules in the Red Rectangle.** Gary D. Schmidt & Adolf N. Witt. 383, 698, 222-G12 (1991)
- Two New Molecular Outflows in L1551?** Marc W. Pound & John Bally. 383, 705, 223-A7 (1991)
- Aperture Synthesis CS(2-1) Observations of a Young Stellar Object GL 490: Accretion Flow in Gas Disk.** Akiko Nakamura, Ryohei Kawabe, Yoshimi Kitamura, Masato Ishiguro, Yasuhiro Murata, & Nagayoshi Ohashi. 383, L81, 226-F5 (1991)
- A Study of  $^{13}\text{CO}$  Cloud Cores in Ophiuchus.** S. Nozawa, A. Mizuno, Y. Teshima, H. Ogawa, & Y. Fukui. 77, 647, 53-E6 (1991)
- LABORATORY SPECTRA**
- The Millimeter-Wave Spectrum of Highly vibrationally Excited  $\text{SiO}$ .** R. Mollaaghatababa, C. A. Gottlieb, J. M. Vrilek, & P. Thaddeus. 368, L19, 28-D1 (1991)
- High-Resolution Absorption Cross Sections of Carbon Monoxide Bands at 295 K between 91.7 and 100.4 Nanometers.** G. Stark, K. Yoshino, Peter L. Smith, K. Ito, & W. H. Parkinson. 369, 574, 44-G13 (1991)
- Far-Infrared Fourier Transform Spectroscopy of  $^{12}\text{C}^{18}\text{O}$ .** P. De Natale, M. Inguscio, C. Rois Orza, & L. R. Zink. 370, L53, 53-G5 (1991)
- Laboratory Observation of the  $^3\text{P}_1 - ^3\text{P}_0$  Transition of the Neutral Carbon Atom by Submillimeter-Wave Absorption Spectroscopy.** Satoshi Yamamoto & Shuji Saito. 370, L103, 59-F7 (1991)
- Ablation of Silicate Particles in High-Speed Continuum and Transition Flow with Application to the Collection of Interplanetary Dust Particles.** Aaron J. Rulison, Richard C. Flagan, Thomas J. Ahrens, & Wayne F. Miller. 371, 432, 65-E5 (1991)
- Laboratory Detection of  $\text{HC}_2\text{N}$  Using a Fourier Transform Microwave Spectrometer.** Minoru Iida, Yasuhiro Ohshima, & Yasuki Endo. 371, L45, 66-F7 (1991)
- Atomic Oxygen Fine-Structure Splittings with Tunable Far-Infrared Spectroscopy.** Lyndon R. Zink, Kenneth M. Evenson, Fusaku Matsushima, Thomas Nelis, & Ruth L. Robinson. 371, L85, 73-E3 (1991)

- The SiH Vibrational Stretch as an Indicator of the Chemical State of Interstellar Grains. *Marla H. Moore, Toshihiko Tanabe, & Joseph A. Nuth.* 373, L31, 91-D7 (1991)
- Trapped H<sub>2</sub>O in SiO Condensate: An Explanation for the 3 Micron Band Observed toward the Galactic Center. *S. Wada, A. Sakata, & A. T. Tokunaga.* 375, L17, 117-C1 (1991)
- Association of CH<sub>4</sub><sup>+</sup> and H<sub>2</sub>: Conflicting Results. *David R. Bates.* 375, 833, 123-A5 (1991)
- Pure Rotational Spectrum of Hydrogen Deuteride by Far-Infrared Fourier Transform Spectroscopy. *Lorenzo Ulivi, Paolo De Natale, & Massimo Inguscio.* 378, L29, 157-D7 (1991)
- Millimeter- and Submillimeter-Wave Spectrum of Highly Excited States of Water. *J. C. Pearson, Todd Anderson, Eric Herbst, Frank C. De Lucia, & Paul Helminger.* 379, L41, 169-D12 (1991)
- On the State of the Emitter of the 3.3 Micron Unidentified Infrared Band: Absorption Spectroscopy of Polycyclic Aromatic Hydrocarbon Species. *Gregory C. Flickinger, Thomas J. Wdowiak, & Percy L. Gómez.* 380, L43, 181-F1 (1991)
- Regularities of Stark Parameters along the Periodic Table. *J. Purić, M. Čuk, M. S. Dimitrijević, & A. Lesage.* 382, 353, 204-E7 (1991)
- Laboratory Infrared Spectra of CH<sub>2</sub>D<sup>+</sup> and HCCD<sup>+</sup> and Predicted Microwave Transitions. *Matthias Rösslein, Mary-Frances Jagod, Charles M. Gabrys, & Takeshi Oka.* 382, LS1, 205-F1 (1991)
- Hydrogenated Amorphous Carbon Grains and the 2175 Å Interstellar Hump. *Armando Blanco, Ezio Bussolati, Luigi Colangeli, Sergio Fonti, & John R. Stephens.* 382, L97, 211-E8 (1991)
- 3.3 Micron Emission from Ultraviolet Excitation of Some Aromatic Molecules. *Jun Shan, Masako Suto, & L. C. Lee.* 383, 459, 218-A7 (1991)
- ### LINE FORMATION
- The Escape of Lyman-Alpha Radiation from a Multiphase Interstellar Medium. *David A. Neufeld.* 370, L85, 59-D13 (1991)
- Magnetic Two-Photon Scattering and Two-Photon Emission: Cross Sections and Redistribution Functions. *S. G. Alexander & P. Mészáros.* 372, 554, 82-E11 (1991)
- Cyclotron Harmonics in Accreting Pulsars and Gamma-Ray Bursters: Effect of Two-Photon Processes. *S. G. Alexander & P. Mészáros.* 372, 565, 82-F9 (1991)
- Temperature-dependent Saturation of Hydrogen Lines in Solar Flares. *K. G. Gayley.* 374, 773, 108-F5 (1991)
- Energy Balance in the Solar Transition Region. II. Effects of Pressure and Energy Input on Hydrostatic Models. *J. M. Fontenla, E. H. Avrett, & R. Loeser.* 377, 712, 148-E1 (1991)
- Fe II Emission Lines. I. Chromospheric Spectra of Red Giants. *P. G. Judge & C. Jordan.* 77, 75, 44-E1 (1991)
- On Solar Emission Lines. *G. P. Malik, L. K. Pande, & Vijaya S. Varma.* 379, 788, 174-E1 (1991)
- The Inability of the Resonant Compton Up-scattering Model of Gamma-Ray Bursts to Produce a Third Cyclotron Harmonic. *J. J. Brainerd.* 379, L57, 175-C1 (1991)
- Formation of the Infrared Emission Lines of Mg I in the Solar Atmosphere. *E. S. Chang, E. H. Avrett, P. J. Mauas, R. W. Noyes, & R. Loeser.* 379, L79, 175-E1 (1991)
- Effects of Aberration and Advection on Line Formation. *A. Peraiah.* 380, 212, 178-F1 (1991)
- Compton Backscattered 511 keV Annihilation Line Emission and the 170 keV Line from the Galactic Center Direction. *Richard E. Lingenfelter & Xin-Min Hua.* 381, 426, 196-A10 (1991)
- N III Line Emission in Planetary Nebulae: Not Bowen Fluorescence. *S. O. Kastner & A. K. Bhatia.* 381, L59, 199-D7 (1991)
- Electric Field Strengths from the Solar 12 Micron Lines. *Edward S. Chang & William G. Schoenfeld.* 383, 450, 217-G9 (1991)
- ### LINE IDENTIFICATIONS
- Southern IRAS Quasar with Extreme Fe II Emission. *S. Lipari, F. D. Macchetto, & D. Golombek.* 366, L65, 11-C1 (1991)
- A Search for vibrationally excited H<sub>2</sub>O at 68 GHz. *S. J. Petuchowski & C. L. Bennett.* 367, 168, 14-B4 (1991)
- The Millimeter-Wave Spectrum of Highly vibrationally excited SiO. *R. Mollaaghatababa, C. A. Gottlieb, J. M. Vrilek, & P. Thaddeus.* 368, L19, 28-D1 (1991)
- New Ultraviolet Spectroscopic Features Found in Comet Brorsen-Metcalf (1989o). *C. R. O'Dell, Christopher O. Miller, Anita L. Cochran, William D. Cochran, Chet B. Opal, & Edwin S. Barker.* 368, 616, 32-G1 (1991)
- Astronomical Detection of H<sub>2</sub>CCC. *J. Cernicharo, C. A. Gottlieb, M. Guélin, T. C. Killian, G. Paubert, P. Thaddeus, & J. M. Vrilek.* 368, L39, 35-C7 (1991)
- Astronomical Detection of H<sub>2</sub>CCCC. *J. Cernicharo, C. A. Gottlieb, M. Guélin, T. C. Killian, P. Thaddeus, & J. M. Vrilek.* 368, L43, 35-C11 (1991)
- A Ubiquitous Absorption Feature in the X-Ray Spectra of BL Lacertae Objects. *Greg M. Madejski, Richard F. Mushotzky, Kimberly A. Weaver, Keith A. Arnaud, & C. Megan Urry.* 370, 198, 49-F1 (1991)
- The Solar Spectrum between 914 and 1177 Å. *U. Feldman & G. A. Doschek.* 75, 925, 14-B13 (1991)
- Theoretical Vibrations of Carbon Chains C<sub>3</sub>, C<sub>4</sub>, C<sub>5</sub>, C<sub>6</sub>, C<sub>7</sub>, C<sub>8</sub>, and C<sub>9</sub>. *Joe Kurtz & Ludwik Adamowicz.* 370, 784, 58-C5 (1991)
- Spectral Observations of the Extreme Ultraviolet Background. *Simon E. Labov & Stuart Bowyer.* 371, 810, 71-F1 (1991)
- An Ultraviolet Spectral Atlas of a Sunspot and an Active Region 1190–1730 Å. *P. Brekke, O. Kjeldseth-Moe, J.-D. F. Bartoe, & G. E. Brueckner.* 75, 1337, 23-C1 (1991)
- The SiH Vibrational Stretch as an Indicator of the Chemical State of Interstellar Grains. *Marla H. Moore, Toshihiko Tanabe, & Joseph A. Nuth.* 373, L31, 91-D7 (1991)
- A High Signal-to-Noise Ratio Composite Quasar Spectrum. *Paul J. Francis, Paul C. Hewett, Craig B. Foltz, Frederic H. Chaffee, Ray J. Weymann, & Simon L. Morris.* 373, 465, 93-F10 (1991)
- Broad Na D Emission in QSOs and the Profile of He I λ5876. *Keith L. Thompson.* 374, 496, 105-C7 (1991)
- Cyclotron Line Features in the Spectrum of the Transient X-Ray Pulsar X0115+634. *F. Nagase, T. Dotani, Y. Tanaka, K. Makishima, T. Mihara, T. Sakao, H. Tsunemi, S. Kitamoto, K. Tamura, A. Yoshida, & H. Nakamura.* 375, L49, 124-B11 (1991)
- The Spectrum of NGC 7027 from 3080 to 2630 Wavenumbers (3.25–3.80 Microns): Detection of New Atomic and Molecular Hydrogen Lines and New Constraints on the Chemical Sidegroups on Polycyclic Aromatic Hydrocarbons. *Scott A. Sandford.* 376, 599, 133-G1 (1991)
- Millimeter- and Submillimeter-Wave Spectrum of Highly Excited States of Water. *J. C. Pearson, Todd Anderson, Eric Herbst, Frank C. De Lucia, & Paul Helminger.* 379, L41, 169-D12 (1991)
- Search for Starbursts among X-Ray-selected Galaxies: Optical Spectroscopy. *Antonella Fruscione & Richard E. Griffiths.* 380, L13, 181-C1 (1991)
- A Catalog of Absorption in the Spectra of Quasi-stellar Objects. *V. Junkkarinen, A. Hewitt, & G. Burbidge.* 77, 203, 47-B1 (1991)
- Molecular Line Survey of Sagittarius B2(M) from 330 to 355 GHz and Comparison with Sagittarius B2(N). *E. C. Sutton, P. A. Jaminet, W. C. Danchi, & Geoffrey A. Blake.* 77, 255, 47-F1 (1991)
- A Table of Astronomically Important Ro-vibrational Transitions for the H<sub>3</sub><sup>+</sup> Molecular Ion. *Lancelot Kao, Takeshi Oka, Steven Miller, & Jonathan Tennyson.* 77, 317, 48-E1 (1991)
- The 1.0–1.3 Micron Spectrum of LkHα 101. *Richard J. Rudy, Peter Erwin, George S. Rossano, & R. C. Puett.* 383, 344, 216-D7 (1991)
- Infrared Molecular Spectroscopy toward the Orion IRC2 and IRC7 Sources: A New Probe of Physical Conditions and Abundances in Molecular Clouds. *Neal J. Evans II, J. H. Lacy, & John S. Carr.* 383, 674, 222-E13 (1991)
- ### LINE PROFILES
- A Study of Solar Flare Energy Transport Based on Coordinated H<sub>α</sub> and X-Ray Observations. *Richard C. Canfield, Dominic M. Zarro, Jean-Pierre Wülser, & Brian R. Dennis.* 367, 671, 21-E11 (1991)
- Spectral Line Profiles and Luminosities of Astrophysical Water Masers. *Gerald E. Nedoluha & William D. Watson.* 367, L63, 22-C11 (1991)
- The Line-emitting Regions of the Exceptional Seyfert Galaxy Markarian 359. *Sylvain Veilleux.* 368, 158, 25-A9 (1991)
- The Interstellar D<sub>1</sub> Line at High Resolution. *L. M. Hobbs & D. E. Welty.* 368, 426, 30-D1 (1991)
- A Study of the Structure and Kinematics of the Narrow-Line Region in Seyfert Galaxies. I. Atlas of Line Profiles. *Sylvain Veilleux.* 75, 357, 5-F1 (1991)

- A Study of the Structure and Kinematics of the Narrow-Line Region in Seyfert Galaxies. II. Analysis of the Line-Profile Parameters.** *Sylvain Veilleux*. 75, 383, 6-A1 (1991)
- Predicted Profiles of Ultraviolet Interstellar Absorption Lines.** *D. E. Wely, L. M. Hobbs, & D. G. York*. 75, 425, 6-E5 (1991)
- A Study of the Structure and Kinematics of the Narrow-Line Region in Seyfert Galaxies. III. Individual Objects.** *Sylvain Veilleux*. 369, 331, 42-A1 (1991)
- Mapping of Infrared Helium and Hydrogen Line Profiles in the Central Few Arcseconds of the Galaxy.** *T. R. Geballe, K. Kriegerius, J. A. Bailey, & R. Wade*. 370, L73, 59-C8 (1991)
- C IV Line Profile Correlations in NGC 4151.** *R. P. Fahey, A. G. Michalasianos, & D. Kazanas*. 371, 136, 61-F9 (1991)
- The Spectral Signatures of Collapse and Outflow around Young Stars.** *E. R. Keto*. 371, 163, 62-B3 (1991)
- Episodic Outflows from High-Mass Protostars.** *G. F. Mitchell, J.-P. Maillard, & T. I. Hasegawa*. 371, 342, 64-D1 (1991)
- Spatial Structure of the Interstellar Gas toward the Globular Cluster M22.** *B. Bates & M. G. Catney*. 371, L37, 66-E7 (1991)
- Ultraviolet Variability of NGC 5548: Dynamics of the Continuum Production Region and Geometry of the Broad-Line Region.** *J. H. Krolik, Keith Horne, T. R. Kallman, M. A. Malkan, R. A. Edelson, & G. A. Kiss*. 371, 541, 68-C6 (1991)
- A Comparison of C IV and H $\beta$  Broad Emission-Line Profiles in Low-Redshift Active Galactic Nuclei.** *Michael R. Corbin*. 371, L51, 73-B1 (1991)
- Broad Na D Emission in QSOs and the Profile of He I  $\lambda$ 5876.** *Keith L. Thompson*. 374, 496, 105-C7 (1991)
- Cyclotron Resonant Scattering and Absorption.** *Alice K. Harding & Joseph K. Daugherty*. 374, 687, 107-E8 (1991)
- The Emission-Line Properties of Steep Radio Spectrum Quasars.** *Michael R. Corbin*. 375, 503, 119-A11 (1991)
- The Smoothness of CO Line Profiles in Orion: Implications for Clumpiness.** *Jan A. Tauber, Paul F. Goldsmith, & Robert L. Dickman*. 375, 635, 120-E7 (1991)
- Probing Shock Models of CH $^+$  Formation.** *Isabel Hawkins & Nahide Craig*. 375, 642, 120-F1 (1991)
- Coronal Dynamics of a Quiescent Active Region.** *Julia L. R. Saba & Keith T. Strong*. 375, 789, 122-D9 (1991)
- Line Profiles from a Disk around a Rotating Black Hole.** *Ari Laor*. 376, 90, 126-B1 (1991)
- Interstellar Scattering Effects on the Detection of Narrow-Band Signals.** *James M. Cordes & T. Joseph Lazio*. 376, 123, 126-D10 (1991)
- Mass Loss in the 96 Day Binary UU Cancri.** *Joel A. Eaton, Douglas S. Hall, & R. Kent Honeycutt*. 376, 289, 128-E1 (1991)
- Unique Broad-Line Profile Variations in the Radio Galaxy 3C 390.3.** *Sylvain Veilleux & Wei Zheng*. 377, 89, 139-B7 (1991)
- Characteristics of Intermediate-Degree Solar p-Mode Line Widths.** *S. M. Jefferies, T. L. Duvall, Jr., J. W. Harvey, Y. Osaki, & M. A. Pomerantz*. 377, 330, 142-A11 (1991)
- First Results from the Goddard High-Resolution Spectrograph: High-Resolution Observations of the 1942 Å Resonance Line of Hg II in the Chemically Peculiar B Star,  $\chi$  Lupi.** *David S. Leckrone, Glenn M. Wahlgren, & Sveneric G. Johansson*. 377, L37, 143-E1 (1991)
- The Analysis of Apparent Optical Depth Profiles for Interstellar Absorption Lines.** *Blair D. Savage & Kenneth R. Sembach*. 379, 245, 166-B5 (1991)
- Echo Images of Broad-Line Regions in Active Galactic Nuclei.** *William F. Welsh & Keith Horne*. 379, 586, 172-A1 (1991)
- Metallic Line Profiles of the A0 V Star Vega.** *Austin F. Gulliver, Saul J. Adelman, Charles R. Cowley, & J. Murray Fletcher*. 380, 223, 178-G1 (1991)
- Inferring Chromospheric Flare Heating from Hydrogen-Line Wings.** *K. G. Gayley & R. C. Canfield*. 380, 660, 186-D1 (1991)
- The Systemic Redshift of the Quasar 1331+170.** *R. F. Carswell, C. M. Mountain, D. J. Robertson, S. M. Beard, A. R. Glendinning, D. C. Laird, L. C. Lawrence, D. Montgomery, G. Penitland, D. A. Pickup, I. A. Smith, J. A. Bailey, A. Bridger, M. M. Casali, T. R. Geballe, P. Puxley, M. G. Smith, G. S. Wright, S. K. Ramsay, A. C. Baker, B. R. Espey, & M. J. Ward*. 381, L5, 194-B1 (1991)
- 3C 390.3: Modeling Variable Profile Humps.** *Wei Zheng, Sylvain Veilleux, & Steven A. Grandi*. 381, 418, 196-A1 (1991)
- Polarization Properties of Emission Lines from Relativistic Accretion Disks.** *Kaiyou Chen & Douglas M. Eardley*. 382, 125, 201-F10 (1991)
- Diffuse Band Profiles in the Spectrum of HD 29647: Evidence for a Molecular Origin?** *Theodore P. Snow & C. G. Seab*. 382, 189, 202-E7 (1991)
- Regularities of Stark Parameters along the Periodic Table.** *J. Purić, M. Čuk, M. S. Dimitrijević, & A. Lesage*. 382, 353, 204-E7 (1991)
- Outflows Driven by Cosmic-Ray Pressure in Broad Absorption Line QSOs.** *Mitchell C. Begelman, Marijn de Kool, & Marek Sikora*. 382, 416, 206-F9 (1991)
- Emission-Line and Continuum Properties of 92 Bright QSOs: Luminosity Dependence and Differences between Radio-selected and Optically Selected Samples.** *Charles C. Steidel & Wallace L. W. Sargent*. 382, 433, 207-A1 (1991)
- Vector Magnetic Fields in Sunspots. I. Stokes Profile Analysis Using the Marshall Space Flight Center Magnetograph.** *K. S. Balasubramanian & E. A. West*. 382, 699, 210-C11 (1991)
- Electric Field Strengths from the Solar 12 Micron Lines.** *Edward S. Chang & William G. Schoenfeld*. 383, 450, 217-G9 (1991)
- A Study of the H $\alpha$  Line in X1735–444.** *Alan P. Smale & Robin H. D. Corbet*. 383, 853, 224-G6 (1991)
- LUMINOSITY FUNCTION**
- Multicomponent Models for the Dynamic Evolution of Globular Clusters.** *Hyung Mok Lee, Gregory G. Fahrlman, & Harvey B. Richer*. 366, 455, 8-E1 (1991)
- The Joint Far-Infrared–Optical Luminosity Function for Spiral Galaxies and Data for the Abell 400 and Cancer Clusters.** *Edvige Corbelli, Edwin E. Salpeter, & John M. Dickey*. 370, 49, 47-F4 (1991)
- Star Formation in Taurus-Auriga: The High-Mass Stars.** *Frederick M. Walter & William T. Boyd*. 370, 318, 51-C1 (1991)
- Altered Luminosity Functions for Relativistically Beamed Objects. II. Distribution of Lorentz Factors and Parent Populations with Complex Luminosity Functions.** *C. M. Urry & P. Padovani*. 371, 60, 60-G5 (1991)
- The Effect of Anisotropic Emission from Thick Accretion Disks on the Luminosity Functions of Active Galactic Nuclei.** *C. M. Urry, P. Marziani, & M. Calvani*. 371, 510, 67-G7 (1991)
- On the Population of H I Dwarf Galaxies.** *David H. Weinberg, Árpád Szomoru, P. Guhathakurta, & J. H. van Gorkom*. 372, L13, 79-B11 (1991)
- A Redshift Survey of IRAS Galaxies. II. Methods for Determining Self-consistent Velocity and Density Fields.** *Amos Yahil, Michael A. Strauss, Marc Davis, & John P. Huchra*. 372, 380, 80-E5 (1991)
- Evolution of the Luminosity Function of Quasar Accretion Disks.** *David M. Cadiz, Vahé Petrosian, & Amri Wandelt*. 372, L63, 85-C1 (1991)
- The Luminosity Distribution of Globular Clusters in Three Giant Virgo Ellipticals.** *William E. Harris, J. W. B. Allwright, Christopher J. Pritchett, & Sidney van den Berg*. 76, 115, 25-D11 (1991)
- The Properties of X-Ray-selected Active Galactic Nuclei. I. Luminosity Function, Cosmological Evolution, and Contribution to the Diffuse X-Ray Background.** *Tommaso Maccacaro, Roberto Della Ceca, Isabella M. Gioia, Simon L. Morris, John T. Stocke, & Anna Wolter*. 374, 117, 99-D11 (1991)
- Infrared Emission in Paired Galaxies. II. Luminosity Functions and Far-Infrared Properties.** *Cong Xu & Jack W. Sulentic*. 374, 407, 104-C5 (1991)
- The Complete Sample of 1 Jansky BL Lacertae Objects. I. Summary Properties.** *M. Stickel, P. Padovani, C. M. Urry, J. W. Fried, & H. Kühl*. 374, 431, 104-E1 (1991)
- The CO Luminosity Function of Galaxies.** *Frances Verter*. 375, 95, 112-B11 (1991)
- The Luminosity Function of Compact Groups of Galaxies.** *Cláudia Mendes de Oliveira & Paul Hickson*. 380, 30, 176-D5 (1991)
- Enrichment and Heating of the Intraccluster Medium through Galactic Winds.** *L. P. David, W. Forman, & C. Jones*. 380, 39, 176-E1 (1991)

- The Stellar Content and Structure of the Globular Cluster NGC 5053.** *Gregory G. Faherty, Harvey B. Richer, & James Nemec.* 380, 124, 177-E11 (1991)
- Tidally Triggered Galaxy Formation. I. Evolution of the Galaxy Luminosity Function.** *Cedric Lacey & Joseph Silk.* 381, 14, 189-C1 (1991)
- Globular Cluster Mass Functions.** *Harvey B. Richer, Gregory G. Faherty, Roberto Buonanno, Flavio Fusi Pecci, Leonard Searle, & Ian B. Thompson.* 381, 147, 190-G7 (1991)
- Fanaroff-Riley I Galaxies as the Parent Population of BL Lacertae Objects. III. Radio Constraints.** *C. M. Urry, P. Padovani, & M. Stickel.* 382, 501, 207-F13 (1991)
- Evolution of Clusters of Galaxies.** *N. Kaiser.* 383, 104, 213-C11 (1991)
- Planetary Nebulae as Standard Candles. VII. A Test versus Hubble Type in the NGC 1023 Group.** *Robin Ciardullo, George H. Jacoby, & William E. Harris.* 383, 487, 220-D1 (1991)
- MAGNETIC FIELDS**
- Formulae for the Cyclotron Luminosity of Magnetized Plasma Slabs.** *G. Channugam & Steven H. Langer.* 368, 580, 32-C11 (1991)
- Polarimetric Mapping of Orion Using MILLIPOL: Magnetic Activity in BN/KL.** *Robert W. Leach, Dan P. Clemens, Brian D. Kane, & Richard Barvainis.* 370, 257, 50-D1 (1991)
- Solar Cycle Variation of the Interplanetary Magnetic Field Spiral.** *Charles W. Smith & John W. Bieber.* 370, 435, 52-F4 (1991)
- Current Sheet Formation and Rapid Reconnection in the Solar Corona.** *A. Bhattacharjee & Xiangang Wang.* 372, 321, 78-A1 (1991)
- Magnetic Confinement, Alfvén Wave Reflection, and the Origins of X-Ray and Mass-Loss "Dividing Lines" for Late-Type Giants and Supergiants.** *R. Rosner, C.-H. An, Z. E. Musielak, R. L. Moore, & S. T. Suess.* 372, L91, 85-E5 (1991)
- Transverse Conductivity of a Relativistic Plasma in Oblique Electric and Magnetic Fields.** *Fulvio Melia & Marco Fatuzzo.* 373, 198, 88-D8 (1991)
- The Expansion of the Crab Nebula.** *M. F. Bietenholz, P. P. Kronberg, D. E. Hogg, & A. S. Wilson.* 373, L59, 97-D5 (1991)
- Multipolar Magnetic Fields in Neutron Stars.** *Julian H. Krolik.* 373, L69, 97-E4 (1991)
- Suppression of Turbulent Transport by a Weak Magnetic Field.** *Fausto Cattaneo & Samuel I. Vainshtein.* 376, L21, 130-C6 (1991)
- Transient Particle Acceleration in Strongly Magnetized Neutron Stars.** *Fulvio Melia & Marco Fatuzzo.* 376, 673, 134-F7 (1991)
- Detection of Excess Rotation Measure Due to Intracluster Magnetic Fields in Clusters of Galaxies.** *K.-T. Kim, Peter C. Tribble, & P. P. Kronberg.* 379, 80, 164-A5 (1991)
- Turbulently Generated Magnetic Fields in Clusters of Galaxies.** *Itzhak Goldman & Yori Rephaeli.* 380, 344, 182-E8 (1991)
- Radiative Widths and Splitting of Cyclotron Lines in Superstrong Magnetic Fields.** *G. G. Pavlov, V. G. Bechastnov, P. Mészáros, & S. G. Alexander.* 380, 541, 185-A1 (1991)
- Avalanches and the Distribution of Solar Flares.** *Edward T. Lu & Russell J. Hamilton.* 380, L89, 188-F5 (1991)
- Magnetoacoustic Heating of the Solar Chromosphere.** *Joseph M. Davila & S. M. Chitre.* 381, L31, 194-D12 (1991)
- Existence of Scattering Atmospheres near Luminous, Magnetized Compact Objects.** *Charles D. Dermer & Steven J. Sturmer.* 382, L23, 205-C11 (1991)
- Transient Particle Acceleration in Strongly Magnetized Neutron Stars. II. Effects Due to a Dipole Field Geometry.** *Marco Fatuzzo & Fulvio Melia.* 382, 570, 208-E10 (1991)
- Gamma-Ray Bursts from Sheared Alfvén Waves.** *Fulvio Melia & Marco Fatuzzo.* 383, L57, 226-D1 (1991)
- A Torsional Oscillation in the Rotation of the Solar Magnetic Field.** *Herschel B. Snodgrass.* 383, L85, 226-F10 (1991)
- MASERS**
- Radiative Transfer in Astronomical Masers. III. Filamentary Masers.** *Moshe Elitzur, Christopher F. McKee, & David J. Hollenbach.* 367, 333, 16-B10 (1991)
- Spectral Line Profiles and Luminosities of Astrophysical Water Masers.** *Gerald E. Nedoluha & William D. Watson.* 367, L63, 22-C11 (1991)
- Excitation of Millimeter and Submillimeter Water Masers.** *David A. Neufeld & Gary J. Melnick.* 368, 215, 25-F11 (1991)
- Saturation of the Synchrotron Megamaser.** *André R. Crusius-Wätzler.* 368, 390, 30-A1 (1991)
- Circular Polarization in 1612 MHz OH Maser Emission from OH/IR Stars.** *Philip J. Zell & John D. Fix.* 369, 506, 44-A9 (1991)
- Polarization of Astronomical Maser Radiation.** *Moshe Elitzur.* 370, 407, 52-C12 (1991)
- The Cyclotron Maser Instability: Application to Low-Density Magnetoplasmas.** *H. P. Ladreiter.* 370, 419, 52-D12 (1991)
- Fluctuations in Astronomical Masers.** *Moshe Elitzur.* 370, L45, 53-F6 (1991)
- New OH Main-Line Detections of OH/IR Stars.** *Dale F. Dickinson & B. E. Turner.* 75, 1323, 23-A9 (1991)
- Solar and Stellar Radio Spikes: Limits on the Saturation of the Electron-Cyclotron Maser.** *Donat G. Wentzel & Markus J. Aschwanden.* 372, 688, 84-C1 (1991)
- VLBI Observations of Interstellar Ammonia Masers.** *Preeti Pratap, Karl M. Menten, Mark J. Reid, James M. Moran, & C. Malcolm Walmsley.* 373, L13, 91-B12 (1991)
- Collisional Pumping of H<sub>2</sub>O Masers in Star-forming Regions.** *Nikolaos D. Kylafis & Colin A. Norman.* 373, 525, 94-D13 (1991)
- Variability of Interstellar Hydroxyl Masers.** *Andrew W. Clegg & James M. Cordes.* 374, 150, 99-G11 (1991)
- NGC 7538 IRS 1: Subarcsecond Resolution Recombination Line and <sup>15</sup>NH<sub>3</sub> Maser Observations.** *R. A. Gaume, K. J. Johnston, H. A. Nguyen, T. L. Wilson, H. R. Dickel, W. M. Goss, & M. C. H. Wright.* 376, 608, 133-G12 (1991)
- 321 GHz Submillimeter Water Masers around Evolved Stars.** *Karl M. Menten & Gary J. Melnick.* 377, 647, 147-F8 (1991)
- Kinematic Models of Maser Shells Formed by Aspherical Stellar Outflows (U Orionis; OH 231.8+4.2; Orion-IRc2).** *P. F. Bowers.* 76, 1099, 40-G9 (1991)
- Pumping the Interstellar (6,3) Ammonia Maser.** *Ronald D. Brown & Dinah M. Cragg.* 378, 445, 156-D10 (1991)
- Excitation of the Hydroxyl Maser in OH/IR Stars.** *Dale F. Dickinson.* 379, L29, 169-C11 (1991)
- The Discovery of a New, Very Strong, and Widespread Interstellar Methanol Maser Line.** *Karl M. Menten.* 380, L75, 188-E1 (1991)
- Molecular Line Survey of Sagittarius B2(M) from 330 to 355 GHz and Comparison with Sagittarius B2(N).** *E. C. Sutton, P. A. Jaminet, W. C. Danchi, & Geoffrey A. Blake.* 77, 255, 47-F1 (1991)
- MASS-LUMINOSITY RELATION**
- Radius-Luminosity and Mass-Luminosity Relationships for Active Galactic Nuclei.** *Anuradha P. Koratkar & C. Martin Gaskell.* 370, L61, 59-B1 (1991)
- METEORS AND METEORITES**
- Interstellar Grains within Interstellar Grains.** *Thomas J. Bernatowicz, Sachiko Amari, Ernst K. Zinner, & Roy S. Lewis.* 373, L73, 97-E10 (1991)
- <sup>26</sup>Al and <sup>16</sup>O in the Early Solar System: Clues from Meteoritic Al<sub>2</sub>O<sub>3</sub>.** *Edward Anders, Alois Virág, Ernst Zinner, & Roy S. Lewis.* 373, L77, 97-F6 (1991)
- Isotopically Anomalous Ti in Presolar SiC from the Murchison Meteorite.** *Trevor R. Ireland, Ernst K. Zinner, & Sachiko Amari.* 376, L53, 137-D7 (1991)
- s-Process Ba, Nd, and Sm in Presolar SiC from the Murchison Meteorite.** *Ernst Zinner, Sachiko Amari, & Roy S. Lewis.* 382, L47, 205-E11 (1991)
- MOLECULAR PROCESSES**
- The In Situ Formation of Large Molecules in Dense Interstellar Clouds.** *Eric Herbst.* 366, 133, 2-F4 (1991)
- CO Fundamental Bands in Late-Type Stars. II. Spectrum Simulations for F-K Stars.** *Gunter Wiedemann & Thomas R. Ayres.* 366, 277, 4-D9 (1991)
- Nitrogen Abundance in Comet Halley.** *Susan Wyckoff, Stephen C. Teigler, & Lisa Engel.* 367, 641, 21-C1 (1991)
- Search for H<sub>2</sub>-He Alloy Formation at Low Pressures and Cosmic Snowballs.** *M. Levensthal & A. P. Mills, Jr.* 368, 178, 25-C7 (1991)
- Ammonia Abundances in Four Comets.** *Susan Wyckoff, Stephen C. Teigler, & Lisa Engel.* 368, 279, 26-E5 (1991)
- The Millimeter-Wave Spectrum of Highly vibrationally Excited SiO.** *R. Mollaaghataba, C. A. Gottlieb, J. M. Vrilek, & P. Thaddeus.* 368, L19, 28-D1 (1991)

- New Ultraviolet Spectroscopic Features Found in Comet Brorsen-Metcalf (1989o). *C. R. O'Dell, Christopher O. Miller, Anita L. Cochran, William D. Cochran, Chet B. Opal, & Edwin S. Barker*. 368, 616, 32-G1 (1991)
- Astronomical Detection of H<sub>2</sub>CCC. *J. Cernicharo, C. A. Gottlieb, M. Guérin, T. C. Killian, G. Paubert, P. Thaddeus, & J. M. Vrilek*. 368, L39, 35-C7 (1991)
- Astronomical Detection of H<sub>2</sub>CCCC. *J. Cernicharo, C. A. Gottlieb, M. Guérin, T. C. Killian, P. Thaddeus, & J. M. Vrilek*. 368, L43, 35-C11 (1991)
- The Formation of Oxygen-containing Organic Molecules in the Orion Compact Ridge. *T. J. Millar, Eric Herbst, & S. B. Charnley*. 369, 147, 37-F11 (1991)
- Electron Densities and the Excitation of CN in Molecular Clouds. *John H. Black & Ewine F. van Dishoeck*. 369, L9, 40-B5 (1991)
- High-Resolution Absorption Cross Sections of Carbon Monoxide Bands at 295 K between 91.7 and 100.4 Nanometers. *G. Stark, K. Yoshino, Peter L. Smith, K. Ito, & W. H. Parkinson*. 369, 574, 44-G13 (1991)
- Far-Infrared Fourier Transform Spectroscopy of <sup>12</sup>C<sup>18</sup>O. *O. P. De Natale, M. Inguscio, C. Rois Orza, & L. R. Zink*. 370, L53, 53-G5 (1991)
- Theoretical Vibrations of Carbon Chains C<sub>3</sub>, C<sub>4</sub>, C<sub>5</sub>, C<sub>6</sub>, C<sub>7</sub>, C<sub>8</sub>, and C<sub>9</sub>. *Joe Kurtz & Ludwik Adamowicz*. 370, 784, 58-C5 (1991)
- The Ultraviolet Continuum and the Fluorescent H<sub>2</sub> Lines in Low-Excitation Herbig-Haro Objects. *K.-H. Böhm, D. M. Scott, & J. Sofl*. 371, 248, 63-C1 (1991)
- Cross Sections for Production of H(2p, 2s, 1s) by Electron Collisional Dissociation of H<sub>2</sub>. *J. M. Ajello, D. E. Shemansky, & G. K. James*. 371, 422, 65-D5 (1991)
- Laboratory Detection of HC<sub>9</sub>N Using a Fourier Transform Microwave Spectrometer. *Minoru Iida, Yasuhiro Ohshima, & Yasuki Endo*. 371, L45, 66-F7 (1991)
- Molecular Hydrogen Formation by Excited Atom Radiative Association. *William B. Latter & John H. Black*. 372, 161, 76-A4 (1991)
- Detection of Low-J Pure-Rotational Emission from H<sub>2</sub> in the Orion Bar Region: Evidence for Small-Scale Clumpiness. *Parvinder S. Parmar, John H. Lacy, & Jeffrey M. Achtermann*. 372, L25, 79-D1 (1991)
- The Gas-Phase Chemistry of Organic Molecules in Interstellar Clouds with Dynamical Mixing. *J.-P. Chièze, G. Pineau des Forets, & Eric Herbst*. 373, 110, 87-D4 (1991)
- The Formation of Molecules in Protostellar Winds. *A. E. Glassgold, G. A. Mamajek, & P. J. Huggins*. 373, 254, 89-B7 (1991)
- Synthetic Profile Analysis of the Observed (0,0) Swan Band of Comet Halley. *K. S. Krishna Swamy*. 373, 266, 89-C7 (1991)
- The SiH Vibrational Stretch as an Indicator of the Chemical State of Interstellar Grains. *Marla H. Moore, Toshihiko Tanabé, & Joseph A. Nuth*. 373, L31, 91-D7 (1991)
- Calculations Concerning the Reaction C + H<sub>3</sub><sup>+</sup> → CH<sup>+</sup> + H<sub>2</sub>. *D. Talbi, D. J. Defrees, D. A. Egolf, & Eric Herbst*. 374, 390, 103-A1 (1991)
- Infrared Fluorescence of H<sub>2</sub> in NGC 6240: A Starburst Origin for the H<sub>2</sub> Luminosity. *Masuo Tanaka, Tetsuo Hasegawa, & Ian Gailey*. 374, 516, 105-E9 (1991)
- A Molecular Line Survey of Sagittarius B2 and Orion-KL from 70 to 115 GHz. II. Analysis of the Data. *B. E. Turner*. 76, 617, 33-D1 (1991)
- Formaldehyde in Envelopes of Interstellar Dark Clouds. *S. R. Federman & M. Allen*. 375, 157, 113-A1 (1991)
- Probing Shock Models of CH<sup>+</sup> Formation. *Isabel Hawkins & Nahide Craig*. 375, 642, 120-F1 (1991)
- Association of CH<sub>3</sub><sup>+</sup> and H<sub>2</sub>: Conflicting Results. *David R. Bates*. 375, 833, 123-A5 (1991)
- Theoretical Study of the Spectroscopy of FeH<sup>+</sup>. *Stephen R. Langhoff & Charles W. Bauschlicher, Jr.* 375, 843, 123-B1 (1991)
- Collisional Excitation of Formaldehyde in "Hot" Interstellar Molecular Regions. *Sheldon Green*. 76, 979, 38-E3 (1991)
- Can Phase Space Theory Reproduce Experimental Neutral Product Branching Ratios for Dissociative Recombination Reactions? *E. T. Galloway & Eric Herbst*. 376, 531, 133-A8 (1991)
- Observations and Chemistry of Interstellar Refractory Elements. *B. E. Turner*. 376, 573, 133-E1 (1991)
- Large Molecule Production by Mass-losing Carbon Stars: The Primary Source of Interstellar Polycyclic Aromatic Hydrocarbons? *William B. Latter*. 377, 187, 140-C5 (1991)
- Partially Dissociative Jump Shocks in Molecular Hydrogen. *C. A. Chang & P. G. Martin*. 378, 202, 153-E1 (1991)
- Pumping the Interstellar (6,3) Ammonia Maser. *Ronald D. Brown & Dinah M. Cragg*. 378, 445, 156-D10 (1991)
- Sulfur-bearing Ions in the Ionosphere of Comet Halley. *M. L. Marconi, D. A. Mendis, D. L. Mitchell, R. P. Lin, A. Korth, & H. Rème*. 378, 756, 161-F7 (1991)
- SiS in Outflow Regions: More High-Temperature Silicon Chemistry. *L. M. Ziurys*. 379, 260, 166-C7 (1991)
- Millimeter- and Submillimeter-Wave Spectrum of Highly Excited States of Water. *J. C. Pearson, Todd Anderson, Eric Herbst, Frank C. De Lucia, & Paul Helminger*. 379, L41, 169-D12 (1991)
- Observations of Solar Wind Ion Charge Exchange in the Comet Halley Coma. *S. A. Fuselier, E. G. Shelley, B. E. Goldstein, R. Goldstein, M. Neugebauer, W.-H. Ip, H. Balsiger, & H. Rème*. 379, 734, 173-G8 (1991)
- Interstellar Photodissociation and Photoionization Rates. *W. G. Robarge, D. Jones, S. Lepp, & A. Dalgarno*. 77, 287, 48-B1 (1991)
- A Table of Astronomically Important Ro-vibrational Transitions for the H<sub>3</sub><sup>+</sup> Molecular Ion. *Lancelot Kao, Takeshi Oka, Steven Miller, & Jonathan Tennyson*. 77, 317, 48-E1 (1991)
- Molecules and Chains in a Strong Magnetic Field: Statistical Treatment. *Andrew M. Abrahams & Stuart L. Shapiro*. 382, 233, 203-B5 (1991)
- Laboratory Infrared Spectra of CH<sub>2</sub>D<sup>+</sup> and HCCD<sup>+</sup> and Predicted Microwave Transitions. *Mathias Rösslein, Mary-Frances Jagod, Charles M. Gabrys, & Takeshi Oka*. 382, L51, 205-F1 (1991)
- The Formation and Role of Water Dimers in a Cometary Atmosphere, with Application to Comet P/Halley. *J. F. Crifo & Z. Slanina*. 383, 351, 216-F1 (1991)
- Comet P/Halley: Spatial Distributions and Scale Lengths for C<sub>2</sub>, CN, NH<sub>3</sub>, and H<sub>2</sub>O. *Uwe Fink, Michael R. Combi, & Michael A. DiSanti*. 383, 356, 216-F9 (1991)
- New Photoionization Models of Intergalactic Clouds. *Megan Donahue & J. Michael Shull*. 383, 511, 220-F1 (1991)
- MOON**
- Testing Einstein's Theory of Gravity by Analyzing Lunar Laser Ranging Data. *J. Müller, M. Schneider, M. Soffel, & H. Ruder*. 382, L101, 211-E12 (1991)
- NEBULAE: ABUNDANCES**
- Far-Infrared Lines from G45.13+0.14 A and K3-50 A: Density Fluctuations in Compact H II Regions. *Sean W. J. Colgan, J. P. Simpson, Robert H. Rubin, Edwin F. Erickson, M. R. Haas, & Jürgen Wolf*. 366, 172, 3-B13 (1991)
- Abundances of Hydrogen Sulfide in Star-forming Regions. *Y. C. Minh, L. M. Ziurys, W. M. Irvine, & D. McGonagle*. 366, 192, 3-D9 (1991)
- Nitrogen Recombination Lines and Abundance in Nova Shells. *Vladimir Escalante & Alexander Dalgarno*. 369, 213, 38-E7 (1991)
- Observations of <sup>12</sup>CO and <sup>13</sup>CO = 9–8 in Galactic Molecular Clouds. *R. T. Boreiko & A. L. Beitz*. 369, 382, 42-E1 (1991)
- Molecular Hydrogen in the Vicinity of NGC 7538 IRS 1 and IRS 2: Temperature and Ortho-to-Para Ratio. *Susan Hoban, Dennis C. Reuter, Michael J. Mumma, & Alex D. Storrs*. 370, 228, 50-A10 (1991)
- The Ionization Structure of Planetary Nebulae. X. NGC 2392. *Timothy Barker*. 371, 217, 62-G5 (1991)
- The Young Supernova Remnants N132D and 1E 0102.2–7219: Limits on the Presence of Rapidly Moving Sulfur. *Barry M. Lasker & David A. Golimowski*. 371, 568, 68-E8 (1991)
- Ne V in Planetary Nebulae. *F. P. Keenan, V. M. Burke, & K. M. Aggarwal*. 371, 636, 69-D13 (1991)
- Nitrogen Abundances in Carbon-rich Stars That Are Progenitors to Planetary Nebulae. *M. Jura*. 372, 208, 76-E7 (1991)
- CS Multitransitional Studies of Density Distribution in Star-forming Regions. I. The NGC 2071 Region. *Shudong Zhou, Neal J. Evans II, Rolf Güsten, Lee G. Mundt, & Marc L. Kutner*. 372, 518, 82-C1 (1991)

- Nitric Oxide in Star-forming Regions: Further Evidence for Interstellar N-O Bonds. *L. M. Ziurys, D. McGonagle, Y. Minh, & W. M. Irvine.* 373, 535, 94-E11 (1991)
- Axisymmetric Model of the Ionized Gas in the Orion Nebula. *R. H. Rubin, J. P. Simpson, M. R. Haas, & E. F. Erickson.* 374, 564, 106-B12 (1991)
- Physical Conditions in the Orion Nebula and an Assessment of Its Helium Abundance. *Jack A. Baldwin, Gary J. Ferland, P. G. Martin, Michael R. Corbin, Stephen A. Cota, Bradley M. Peterson, & Arne Slettebak.* 374, 580, 106-D1 (1991)
- Theoretical H II Region Models: The Effects of Stellar Atmosphere Models. *I. N. Evans.* 76, 985, 38-E13 (1991)
- Photoionization Modeling of Magellanic Cloud Planetary Nebulae. II. *M. A. Dopita & S. J. Meatheringham.* 377, 480, 145-F6 (1991)
- A Grain-heated, Dusty Planetary Nebula in M22. *Kazimierz J. Borkowski & J. Patrick Harrington.* 379, 168, 165-B1 (1991)
- H II Region Abundances: Model Oxygen Line Ratios. *Stacy S. McGaugh.* 380, 140, 177-G1 (1991)
- The 0.46–1.3 Micron Spectrum of the Planetary Nebula BD +30°3639. *Richard J. Rudy, Ross D. Cohen, George S. Rossano, Peter Erwin, R. C. Puettner, & David K. Lynch.* 380, 151, 178-A1 (1991)
- CO J = 3-2 and J = 2-1 Observations of NGC 7027. *P. A. Jaminet, W. C. Danchi, E. C. Sutton, A. P. G. Russell, Göran Sandell, J. H. Bieging, & D. Wilner.* 380, 461, 184-A4 (1991)
- Core Masses and Abundances of Low-Excitation Planetary Nebulae in the Magellanic Clouds. *James B. Kaler & George H. Jacoby.* 382, 134, 201-G7 (1991)
- NEBULAE: CRAB NEBULA**
- Faraday Rotation and Physical Conditions in the Crab Nebula. *M. F. Bietenholz & P. P. Kronberg.* 368, 231, 26-A1 (1991)
- Observation of a Pulsar Wind: CCD Polarimetry of the Crab Nebula. *F. C. Michel, P. A. Scowen, R. J. Dufour, & J. J. Hester.* 368, 463, 30-G1 (1991)
- Hard X-Ray Variability of NGC 4151. *F. Perotti, P. Maggioli, E. Quadrini, A. Bazzano, P. Ubertini, L. Bassani, J. B. Stephen, A. J. Cour, A. J. Dean, N. A. Dipper, & R. A. Lewis.* 373, 75, 87-A1 (1991)
- The Expansion of the Crab Nebula. *M. F. Bietenholz, P. P. Kronberg, D. E. Hogg, & A. S. Wilson.* 373, L59, 97-D5 (1991)
- Gamma-Ray Observations of the Crab Nebula at TeV Energies. *G. Vacanti, M. F. Cawley, E. Colombo, D. J. Fegan, A. M. Hillas, P. W. Kwock, M. J. Lang, R. C. Lamb, D. A. Lewis, D. J. Macomb, K. S. O'Flaherty, P. T. Reynolds, & T. C. Weekes.* 377, 467, 145-E4 (1991)
- Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy. *C. W. Akerlof, M. F. Cawley, M. Chantell, D. J. Fegan, K. Harris, A. M. Hillas, D. G. Jennings, R. C. Lamb, M. A. Lawrence, M. J. Lang, D. A. Lewis, D. I. Meyer, G. Mohanty, K. S. O'Flaherty, M. Punch, P. T. Reynolds, M. S. Schubnell, T. C. Weekes, & T. Whittaker.* 377, L97, 150-E6 (1991)
- A Model of Unpulsed Very High Energy Gamma Rays from the Crab Nebula and Pulsar. *P. W. Kwock, K. S. Cheng, & M. M. Lau.* 379, 653, 172-G1 (1991)
- NEBULAE: GENERAL**
- Relative Populations for Levels in the 3d<sup>2</sup> Ground Configuration of Fe VII. *F. P. Keenan & H. P. Norrington.* 368, 486, 31-B7 (1991)
- Bok Globules and Small Molecular Clouds: Deep IRAS Photometry and <sup>12</sup>CO Spectroscopy. *Dan P. Clemens, João Lin Yun, & Mark H. Heyer.* 75, 877, 13-E1 (1991)
- HH 5, HH 6, and Their Exciting Stars. *Martin Cohen, Burton F. Jones, & Mark Hereld.* 371, 237, 63-B1 (1991)
- Spectra of Two Very Old Supernovae: SN 1986J and SN 1980K. *Bruno Leibundgut, Robert P. Kirshner, Philip A. Pinto, Michael P. Rupen, R. Chris Smith, James E. Gunn, & Donald P. Schneider.* 372, 531, 82-D1 (1991)
- Size and Density Distribution of Very Small Dust Grains in the Barnard 5 Cloud. *Dariusz C. Lis & Chun Ming Leung.* 372, L107, 85-F9 (1991)
- Fragmentation of Elongated Cylindrical Clouds. III. Formation of Binary and Multiple Systems. *Ian Bonnell, Hugo Martel, Pierre Bastien, Jean-Pierre Arcoragi, & Willy Benz.* 377, 553, 146-E5 (1991)
- Fragmentation of Elongated Cylindrical Clouds. I. Isothermal Clouds. *Pierre Bastien, Jean-Pierre Arcoragi, Willy Benz, Ian Bonnell, & Hugo Martel.* 378, 255, 154-B5 (1991)
- Radiation Transport in Dust in Disk Geometry. I. Application to Externally Heated Interstellar Clouds. *George F. Spagna, Jr., Chun Ming Leung, & Michael P. Egan.* 379, 232, 166-A5 (1991)
- Fragmentation of Elongated Cylindrical Clouds. II. Polytropic Clouds. *Jean-Pierre Arcoragi, Ian Bonnell, Hugo Martel, Willy Benz, & Pierre Bastien.* 380, 476, 184-B7 (1991)
- N III Line Emission in Planetary Nebulae: Not Bowen Fluorescence. *S. O. Kastner & A. K. Bhatia.* 381, L59, 199-D7 (1991)
- Molecular Line Emission Models of Herbig-Haro Objects. I. H<sub>2</sub> Emission. *Mark G. Wolfe & Arieh Königl.* 383, 205, 214-E9 (1991)
- NEBULAE: H II REGIONS**
- Abundances in H II Regions at the Edge of the Galaxy. *Michel Fich & Mariabeth Silkey.* 366, 107, 2-D1 (1991)
- Far-Infrared Lines from G45.13+0.14 A and K3-50 A: Density Fluctuations in Compact H II Regions. *Sean W. J. Colgan, J. P. Simpson, Robert H. Rubin, Edwin F. Erickson, M. R. Haas, & Jürgen Wolf.* 366, 172, 3-B13 (1991)
- H II Regions in M82: High-Resolution Millimeter Continuum Observations. *J. E. Carlstrom & Philipp P. Kronberg.* 366, 422, 8-B1 (1991)
- Superbubble Blowout in the Giant H II Region NGC 2363? *Jean-René Roy, J. Boulesteix, Gilles Joncas, & B. Grundseth.* 367, 141, 13-F8 (1991)
- Ultraviolet Interstellar Lines in the Spectrum of  $\pi$  Scorpii Recorded at 2 Kilometers per Second Resolution. *Charles L. Joseph & Edward B. Jenkins.* 368, 201, 25-E9 (1991)
- Bow Shock Models of Ultracompact H II Regions. *Mordecai-Mark Mac Low, Dave Van Buren, Douglas O. S. Wood, & Ed Churchwell.* 369, 395, 42-F1 (1991)
- Radio Recombination Lines from Diffuse Interstellar Gas in the Galaxy. *J. C. Cersosimo & J. S. Onello.* 370, 225, 50-A5 (1991)
- Molecular Hydrogen in the Vicinity of NGC 7538 IRS 1 and IRS 2: Temperature and Ortho-to-Para Ratio. *Susan Hoban, Dennis C. Reuter, Michael J. Mumma, & Alex D. Storrs.* 370, 228, 50-A10 (1991)
- IRAS 23545+6508, a Dissociating Star: Prototype for a New Observational Class? *P. E. Dewdney, R. S. Roger, C. R. Purton, & W. H. McCutcheon.* 370, 243, 50-C1 (1991)
- Polarimetric Mapping of Orion Using MILLIPOL: Magnetic Activity in BN/KL. *Robert W. Leach, Dan P. Clemens, Brian D. Kane, & Richard Barvainis.* 370, 257, 50-D1 (1991)
- A Search for Embedded Young Stellar Objects in and near the IC 1396 Complex. *Richard D. Schwartz, Armen L. Gyulbudaghian, & Bruce A. Wilking.* 370, 263, 50-D9 (1991)
- A Study of Star Formation in the Disks of Sa Galaxies. *Nelson Caldwell, Robert Kennicutt, Andrew C. Phillips, & Robert A. Schommer.* 370, 526, 54-G12 (1991)
- An X-Ray Image of the Violent Interstellar Medium in 30 Doradus. *Q. Wang & D. J. Helfand.* 370, 541, 55-B9 (1991)
- A Large Supershell H II Region Complex in the Large Magellanic Cloud and the Interstellar Environment of SN 1987A. *Frederick C. Bruhweiler, Michelle A. Fitzurka, & Theodore R. Gull.* 370, 551, 55-C9 (1991)
- Protostellar Condensations in the Core of NGC 2024. *D. C. Lis, J. E. Carlstrom, & T. G. Phillips.* 370, 583, 55-F5 (1991)
- High Chemical Abundances in Virgo Spiral Galaxies? *Gregory A. Shields, Evan D. Skillman, & Robert C. Kennicutt, Jr.* 371, 82, 61-B1 (1991)
- Far-Infrared Properties of NGC 6822. *John S. Gallagher III, Deidre A. Hunter, Fred C. Gillett, & Walter L. Rice.* 371, 142, 61-G1 (1991)
- The Infrared Properties of Compact Galactic Radio Sources: The Young and the Restless. *Richard L. White, Robert H. Becker, & David J. Helfand.* 371, 148, 62-A1 (1991)
- The Spectral Signatures of Collapse and Outflow around Young Stars. *E. R. Keto.* 371, 163, 62-B3 (1991)
- Multifrequency VLA Observations of Radio Continuum from IRAS 16293–2422. *R. Estalella, G. Anglada, L. F. Rodríguez, & G. Garay.* 371, 626, 69-C12 (1991)

- VLBI Observations of Interstellar Ammonia Masers.** *Preethi Pratap, Karl M. Menten, Mark J. Reid, James M. Moran, & C. Malcolm Walmsley.* 373, L13, 91-B12 (1991)
- H II Emission in Extragalactic H II Regions.** *Donald R. Garnett, Robert C. Kennicutt, Jr., You-Hua Chu, & Evan D. Skillman.* 373, 458, 93-E14 (1991)
- The Hydrodynamics of Relict Cosmological H II Regions and the Formation of Objects at High Redshift.** *Piero Madau & Avery Meiksin.* 374, 98-B7 (1991)
- Infrared Images of M17.** *Charles J. Lada, D. L. DePoy, K. M. Merrill, & Ian Gailey.* 374, 533, 105-G1 (1991)
- Physical Conditions in the Orion Nebula and an Assessment of Its Helium Abundance.** *Jack A. Baldwin, Gary J. Ferland, P. G. Martin, Michael R. Corbin, Stephen A. Cota, Bradley M. Peterson, & Arne Slettebak.* 374, 580, 106-D1 (1991)
- Near-Infrared Emission of Neutral Carbon from Photon-dominated Regions.** *V. Escalante, A. Sternberg, & A. Dalgarno.* 375, 630, 120-E1 (1991)
- Theoretical H II Region Models: The Effects of Stellar Atmosphere Models.** *I. N. Evans.* 76, 985, 38-E13 (1991)
- The Dissipation of Magnetohydrodynamic Turbulence Responsible for Interstellar Scintillation and the Heating of the Interstellar Medium.** *Steven R. Spangler.* 376, 540, 133-B5 (1991)
- NGC 7538 IRS 1: Subarcsecond Resolution Recombination Line and  $^{15}\text{NH}_3$  Maser Observations.** *R. A. Gaume, K. J. Johnston, H. A. Nguyen, T. L. Wilson, H. R. Dickel, W. M. Goss, & M. C. H. Wright.* 376, 608, 133-G12 (1991)
- The Origin of the Quasi-stellar Object Absorption Lines.** *S. M. Viegas & R. B. Gruenwald.* 377, 39, 138-E5 (1991)
- Ultraviolet and Optical Spectroscopy of the R Aquarii Symmetrical Jet.** *J. M. Hollis, R. J. Oliversen, M. Kafatos, A. G. Michalitsianos, & R. M. Wagner.* 377, 227, 140-F11 (1991)
- Two Micron Spectroscopy of Infrared Sources in NGC 2071.** *D. M. Walther, T. R. Geballe, & E. I. Robson.* 377, 246, 141-A9 (1991)
- The Dense Molecular Envelope around the Compact H II Region G5.89–0.39 (W28 A2).** *Yolanda Gómez, Luis F. Rodríguez, Guido Garay, & James M. Moran.* 377, 519, 146-B9 (1991)
- A Statistical Study of the Correlation of Galactic Supernova Remnants and Spiral Arms.** *Zongwei Li, J. Craig Wheeler, Frank N. Bash, & W. H. Jeffrys.* 378, 93, 152-B9 (1991)
- First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.** *G. Weigelt, R. Albrecht, C. Barbieri, J. C. Blades, A. Bokkenberg, P. Crane, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kamperman, I. R. King, F. Macchetto, C. D. Mackay, P. Parese, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, & W. B. Sparks.* 378, L21, 157-C7 (1991)
- Synthesis Imaging of the DR 21(OH) Cluster. I. Dust Continuum and  $\text{C}^{18}\text{O}$  Emission.** *Jeffrey G. Mangum, Alwyn Wootten, & Lee G. Mundy.* 378, 576, 159-E3 (1991)
- SiS in Outflow Regions: More High-Temperature Silicon Chemistry.** *L. M. Ziurys.* 379, 260, 166-C7 (1991)
- A Catalog of Bright-rimmed Clouds with IRAS Point Sources: Candidates for Star Formation by Radiation-driven Implosion. I. The Northern Hemisphere.** *Koji Sugitani, Yasuo Fukui, & Katsu Ogura.* 377, 59, 44-B1 (1991)
- IUE Observations of NGC 1068: The Extremely Luminous Starburst Knots.** *F. C. Bruhweiler, K. Q. Truong, & B. Altner.* 379, 596, 172-B1 (1991)
- IUE Observations of NGC 1068: The Extended High-Ionization Emission Region.** *K. Q. Truong & F. C. Bruhweiler.* 379, 609, 172-C1 (1991)
- H II Region Abundances: Model Oxygen Line Ratios.** *Stacy S. McGaugh.* 380, 140, 177-G1 (1991)
- The Upper Bound to the Primordial Abundance of Helium and the Consistency of the Hot Big Bang Model.** *Keith A. Olive, Gary Steigman, & Terry P. Walker.* 380, L1, 181-B1 (1991)
- The Discovery of a New, Very Strong, and Widespread Interstellar Methanol Maser Line.** *Karl M. Menten.* 380, L75, 188-E1 (1991)
- H II Regions in Seven Dwarf Irregular Galaxies.** *Nicolas V. Strobel, Paul Hodge, & Robert C. Kennicutt, Jr.* 383, 148, 213-G3 (1991)
- Two Planetary Nebulae in the Direction of the Galactic Center.** *A. Gutiérrez-Moreno, H. Moreno, & G. Cortés.* 383, 174, 214-C1 (1991)
- Gravitational Fragmentation: A Comparison with W49A.** *Eric R. Keto, John C. Lattanzio, & Joe J. Monaghan.* 383, 639, 222-B12 (1991)
- High-Resolution Spectroscopy of Partially Ionized Gas around H II Regions.** *Joseph S. Onello, J. A. Phillips, & Yervant Terzian.* 383, 693, 222-G6 (1991)
- A Model for the Infrared Emission from an OB Star Cluster Environment.** *D. Leisawitz.* 77, 451, 51-B1 (1991)
- NEBULAE: INDIVIDUAL**
- Messier Number: M17**
- Infrared Images of M17.** *Charles J. Lada, D. L. DePoy, K. M. Merrill, & Ian Gailey.* 374, 533, 105-G1 (1991)
- NGC Number: NGC 1977**
- Parsec-Scale Penetration of Ultraviolet Photons into Molecular Clouds: [C II] 158 Micron Mapping of W3, NGC 1977, and NGC 2023.** *J. E. Howe, D. T. Jaffe, R. Genzel, & G. J. Stacey.* 373, 158, 88-A5 (1991)
- NGC Number: NGC 2023**
- Parsec-Scale Penetration of Ultraviolet Photons into Molecular Clouds: [C II] 158 Micron Mapping of W3, NGC 1977, and NGC 2023.** *J. E. Howe, D. T. Jaffe, R. Genzel, & G. J. Stacey.* 373, 158, 88-A5 (1991)
- NGC Number: NGC 2024**
- Protostellar Condensations in the Core of NGC 2024.** *D. C. Lis, J. E. Carlstrom, & T. G. Phillips.* 370, 583, 55-F5 (1991)
- NGC Number: NGC 2071**
- CS Multitransitional Studies of Density Distribution in Star-forming Regions. I. The NGC 2071 Region.** *Shudong Zhou, Neal J. Evans II, Rolf Güsten, Lee G. Mundy, & Marc L. Kutner.* 372, 518, 82-C1 (1991)
- NGC Number: NGC 2245**
- Emission from Dust in Visual Reflection Nebulae at Infrared and Submillimeter Wavelengths.** *Sean C. Casey.* 371, 183, 62-D1 (1991)
- NGC Number: NGC 2247**
- Emission from Dust in Visual Reflection Nebulae at Infrared and Submillimeter Wavelengths.** *Sean C. Casey.* 371, 183, 62-D1 (1991)
- NGC Number: NGC 2363**
- Superbubble Blowout in the Giant H II Region NGC 2363?** *Jean-René Roy, J. Boulesteix, Gilles Joncas, & B. Grundseth.* 367, 141, 13-F8 (1991)
- NGC Number: NGC 2392**
- The Ionization Structure of Planetary Nebulae. X. NGC 2392.** *Timothy Barker.* 371, 217, 62-G5 (1991)
- NGC Number: NGC 2440**
- Neutral Oxygen in Planetary Nebulae: Probing Radiative Transfer and Nebular Structure.** *Michael G. Richer, Marshall L. McCall, & Peter G. Martin.* 377, 210, 140-E1 (1991)
- NGC Number: NGC 3918**
- Neutral Oxygen in Planetary Nebulae: Probing Radiative Transfer and Nebular Structure.** *Michael G. Richer, Marshall L. McCall, & Peter G. Martin.* 377, 210, 140-E1 (1991)
- NGC Number: NGC 6302**
- NGC 6302: Ionized by a Very Hot Star or by a Wind?** *N. J. Lane & G. J. Ferland.* 367, 208, 14-F1 (1991)
- NGC Number: NGC 6572**
- Near-Infrared Spectroscopy of the Planetary Nebula NGC 6572.** *Richard J. Rudy, George S. Rossano, Peter Erwin, & R. C. Puettner.* 368, 468, 30-G13 (1991)
- NGC Number: NGC 6751**
- The Multiple-Shell Structure of the Planetary Nebula NGC 6751.** *You-Hua Chu, Arturo Manchado, George H. Jacoby, & Karen B. Krwitter.* 376, 150, 126-F13 (1991)

**NGC Number: NGC 7023**

Emission from Dust in Visual Reflection Nebulae at Infrared and Submillimeter Wavelengths. *Sean C. Casey.* 371, 183, 62-D1 (1991)

**NGC Number: NGC 7027**

Emission Features in the Spectrum of NGC 7027 near 3.3 Microns at Very High Resolution. *R. P. Lowe, J. M. Moorhead, W. H. Wehlau, & J.-P. Maillard.* 368, 195, 25-E1 (1991)

Relative Populations for Levels in the 3d<sup>2</sup> Ground Configuration of Fe VII. *F. P. Keenan & P. H. Norrington.* 368, 486, 31-B7 (1991)

The Spectrum of NGC 7027 from 3080 to 2630 Wavenumbers (3.25–3.80 Microns): Detection of New Atomic and Molecular Hydrogen Lines and New Constraints on the Chemical Sidegroups on Polycyclic Aromatic Hydrocarbons. *Scott A. Sandford.* 376, 599, 133-G1 (1991)

The Molecular Envelope of NGC 7027. *John H. Bieging, David Wilner, & Harley A. Thronson, Jr.* 379, 271, 166-D9 (1991)

CO J = 3–2 and J = 2–1 Observations of NGC 7027. *P. A. Jaminet, W. C. Danchi, E. C. Sutton, A. P. G. Russell, Göran Sandell, J. H. Bieging, & D. Wilner.* 380, 461, 184-A4 (1991)

**NGC Number: NGC 7538**

Molecular Hydrogen in the Vicinity of NGC 7538 IRS 1 and IRS 2: Temperature and Ortho-to-Para Ratio. *Susan Hoban, Dennis C. Reuter, Michael J. Mumma, & Alex D. Storrs.* 370, 228, 50-A10 (1991)

The Spectral Signatures of Collapse and Outflow around Young Stars. *E. R. Keto.* 371, 163, 62-B3 (1991)

NGC 7538 IRS 1: Subarcsecond Resolution Recombination Line and <sup>13</sup>NH<sub>3</sub> Maser Observations. *R. A. Gaume, K. J. Johnston, H. A. Nguyen, T. L. Wilson, H. R. Dickey, W. M. Goss, & M. C. H. Wright.* 376, 608, 133-G12 (1991)

**Name: R Aquarii**

First Results from the Faint Object Camera: Imaging the Core of R Aquarii. *F. Paresce, R. Albrecht, C. Barbieri, J. C. Blades, A. Boksenberg, P. Crane, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kampman, I. R. King, F. Macchetto, C. D. Mackay, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, & W. B. Sparks.* 369, L67, 46-B7 (1991)

Narrow-Band Imaging of the Inner R Aquarii Nebula: Further Evidence for Shock Excitation. *Denis Burgarella & Francesco Paresce.* 370, 590, 55-G1 (1991)

Ultraviolet and Optical Spectroscopy of the R Aquarii Symmetrical Jet. *J. M. Hollis, R. J. Oliversen, M. Kafatos, A. G. Michalitsianos, & R. M. Wagner.* 377, 227, 140-F11 (1991)

**Name: Barnard 5**

Anatomy of the Barnard 5 Core. *G. A. Fuller, P. C. Myers, W. J. Welch, P. E. Goldsmith, W. D. Langer, B. G. Campbell, S. Guilloteau, & R. W. Wilson.* 376, 135, 126-E10 (1991)

**Name: Cassiopeia A**

New Clues to the Cassiopeia A Supernova Progenitor. *Robert A. Fesen & Robert H. Becker.* 371, 621, 69-C4 (1991)

VLA Observations of 21 Centimeter H I Absorption toward Cassiopeia A. *John H. Bieging, W. Miller Goss, & Eric M. Wilcots.* 75, 999, 16-F5 (1991)

Relativistic Electron Populations in Cassiopeia A. *M. Anderson, L. Rudnick, P. Leppik, R. Perley, & R. Braun.* 373, 146, 87-G4 (1991)

**Name: Cygnus Loop**

The H<sub>2</sub> Line Profiles in the Cygnus Loop: Evidence for J-Shocks with Magnetic Precursors. *James R. Graham, Gillian S. Wright, & T. R. Geballe.* 372, L21, 79-C7 (1991)

Far-Ultraviolet Mapping of the Cygnus Loop with the Voyager 2 Ultraviolet Spectrometer. *William P. Blair, Knox S. Long, Olaf Vancura, & J. B. Holberg.* 374, 202, 100-E5 (1991)

A Kinematic and Proper-Motion Survey of the Cygnus Loop. *Peter Shull, Jr., & Hans Hippelien.* 383, 714, 223-B3 (1991)

**Name: 30 Doradus**

An X-Ray Image of the Violent Interstellar Medium in 30 Doradus. *Q. Wang & D. J. Helfand.* 370, 541, 55-B9 (1991)

**Name: Kepler's Supernova**

A Detailed Optical Study of Kepler's Supernova Remnant. *William P. Blair, Knox S. Long, & Olaf Vancura.* 366, 484, 9-A1 (1991)

Changes in the Optical Remnant of Kepler's Supernova during the Period 1942–1989. *Rino Bandiera & Sidney van den Bergh.* 374, 186, 100-C11 (1991)

**Name: Monoceros R2**

The Structure and Kinematics of Bipolar Outflows: Observations and Models of the Monoceros R2 Outflow. *Barry A. Meyers-Rice & Charles J. Lada.* 368, 445, 30-E10 (1991)

**Name:  $\rho$  Ophiuchi**

Direct VLBI Detection of the Magnetosphere Surrounding the Young Star S1 in  $\rho$  Ophiuchi. *Philippe André, Robert B. Phillips, Jean-François Lestrade, & Karl-Ludwig Klein.* 376, 630, 134-B12 (1991)

A Rich Cluster of Radio Stars in the  $\rho$  Ophiuchi Cloud Cores. *James A. Leous, Eric D. Feigelson, Philippe André, & Thierry Montmerle.* 379, 683, 173-B10 (1991)

**Name: Orion A**

Infrared Dust and Millimeter-Wave Carbon Monoxide Emission in the Orion Region. *John Bally, William D. Langer, & Weihong Liu.* 383, 645, 222-C6 (1991)

**Name: Orion B**

Protostellar Condensations in the Core of NGC 2024. *D. C. Lis, J. E. Carlstrom, & T. G. Phillips.* 370, 583, 55-F5 (1991)

A 2.2 Micron Survey in the L1630 Molecular Cloud. *Elizabeth A. Lada, D. L. DePoy, Neal J. Evans II, & Ian Gatley.* 371, 171, 62-C1 (1991)

Infrared Dust and Millimeter-Wave Carbon Monoxide Emission in the Orion Region. *John Bally, William D. Langer, & Weihong Liu.* 383, 645, 222-C6 (1991)

**Name: Puppis A**

An Infrared Analysis of Puppis A. *Richard G. Arendt, Eli Dwek, & Robert Petre.* 368, 474, 31-A7 (1991)

The O VII Soft X-Ray Spectrum and Its Application to Hot Plasmas in Astrophysics. *A. H. Gabriel, F. Bely-Dubau, P. Faucher, & L. W. Acton.* 378, 438, 156-D1 (1991)

**Name: Red Rectangle**

X Marks the Spot: Distribution and Excitation of Unidentified Molecules in the Red Rectangle. *Gary D. Schmidt & Adolf N. Witt.* 383, 698, 222-G12 (1991)

**Name: Sagittarius B2**

High-Density Gas in the Core of the Sagittarius B2 Molecular Cloud. *Dariusz C. Lis & Paul F. Goldsmith.* 369, 157, 37-G11 (1991)

A Molecular Line Survey of Sagittarius B2 and Orion-KL from 70 to 115 GHz. II. Analysis of the Data. *B. E. Turner.* 76, 617, 33-D1 (1991)

Millimeter Continuum Observations of Galactic Center Giant Molecular Cloud Cores. *D. C. Lis, J. E. Carlstrom, & Jocelyn Keene.* 380, 429, 183-E7 (1991)

Molecular Line Survey of Sagittarius B2(M) from 330 to 355 GHz and Comparison with Sagittarius B2(N). *E. C. Sutton, P. A. Jaminet, W. C. Danchi, & Geoffrey A. Blake.* 77, 255, 47-F1 (1991)

**Name: Sagittarius C**

Millimeter Continuum Observations of Galactic Center Giant Molecular Cloud Cores. *D. C. Lis, J. E. Carlstrom, & Jocelyn Keene.* 380, 429, 183-E7 (1991)

**Name: Sagittarius D**

Millimeter Continuum Observations of Galactic Center Giant Molecular Cloud Cores. *D. C. Lis, J. E. Carlstrom, & Jocelyn Keene.* 380, 429, 183-E7 (1991)

**Name: Taurus Dark Cloud**

Two Micron Morphology of Candidate Protostars. *Motohide Tamura, Ian Gatley, William Waller, & Michael W. Werner.* 374, L25, 103-E7 (1991)

**Name: Vela Supernova Remnant**

Variable Interstellar Absorption toward HD 72127A. II. 1981–1988. *L. M. Hobbs, R. Ferlet, D. E. Welty, & G. Wallerstein.* 378, 586, 159-F1 (1991)

Evidence for a Thermally Unstable Shock Wave in the Vela Supernova Remnant. *John C. Raymond, George Wallerstein, & Bruce Balick.* 383, 226, 214-G5 (1991)

**Alphanumeric: B335**

Observations of HCO<sup>+</sup> in B335. *Tatsuhiro I. Hasegawa, C. Rogers, & Saeko Suzuki Hayashi.* 374, 177, 100-C1 (1991)

**Alphanumeric: BD +30°3639**

The 0.46–1.3 Micron Spectrum of the Planetary Nebula BD +30°3639. *Richard J. Rudy, Ross D. Cohen, George S. Rossano, Peter Erwin, R. C. Puettner, & David K. Lynch.* 380, 151, 178-A1 (1991)

**Alphanumeric: 3C 400.2**

W28 and 3C 400.2: Two Shell-like Radio Supernova Remnants with Centrally Peaked X-Ray Morphologies. *Knox S. Long, William P. Blair, Richard L. White, & Yutaka Matsui.* 373, 567, 95-A10 (1991)

**Alphanumeric: CED 201**

Emission from Dust in Visual Reflection Nebulae at Infrared and Submillimeter Wavelengths. *Sean C. Casey.* 371, 183, 62-D1 (1991)

**Alphanumeric: DR 21**

A Spectroscopic Study of the DR 21 Outflow Source. II. The Vibrational H<sub>2</sub> Line Emission. *R. P. Garden, T. R. Geballe, I. Gatley, & D. Nadeau.* 366, 474, 8-G1 (1991)

The Extinction to the H<sub>2</sub> Line Emission in the DR 21 Outflow Source. *Daniel Nadeau, Martin Riopel, & T. R. Geballe.* 372, L103, 85-F5 (1991)

A Spectroscopic Study of the DR 21 Outflow Source. III. The CO Line Emission. *R. P. Garden, M. Hayashi, I. Gatley, T. Hasegawa, & N. Kaifu.* 374, 540, 105-G11 (1991)

**Alphanumeric: DR 21(OH)**

Synthesis Imaging of the DR 21(OH) Cluster. I. Dust Continuum and C<sub>18</sub>O Emission. *Jeffrey G. Mangum, Alwyn Wootten, & Lee G. Mundy.* 378, 576, 159-E3 (1991)

**Alphanumeric: 1E 0102–7219**

The Young Supernova Remnant N132D and 1E 0102.2–7219: Limits on the Presence of Rapidly Moving Sulfur. *Barry M. Lasker & David A. Golimowski.* 371, 568, 68-E8 (1991)

**Alphanumeric: G29.96–0.02**

The Dynamics and Physical Properties of the Cometary Nebula G29.96–0.02. *Douglas O. S. Wood & Ed Churchwell.* 372, 199, 76-D8 (1991)

**Alphanumeric: G45.13+0.14**

Far-Infrared Lines from G45.13+0.14 A and K3-50 A: Density Fluctuations in Compact H II Regions. *Sean W. J. Colgan, J. P. Simpson, Robert H. Rubin, Edwin F. Erickson, M. R. Haas, & Jürgen Wolf.* 366, 172, 3-B13 (1991)

**Alphanumeric: G348+0**

A New Look at the "Jet" in the CTB 37A/B Supernova Remnant Complex. *Namir E. Kassim, Stefi A. Baum, & Kurt W. Weiler.* 374, 212, 100-F9 (1991)

**Alphanumeric: GGD 27**

The Dense, Inner Part of the Protostellar Disk: Protostar Candidates in GGD 27 IRS. *Takuya Yamashita, Yasuhiro Murata, Ryohi Kawabe, Norio Kaifu, & Motohide Tamura.* 373, 560, 95-A1 (1991)

**Alphanumeric: GL 618**

Proto-Planetary Nebulae. II. The Shock-heated Bipolar Nebulae GL 618 and M2-56. *Robert W. Goodrich.* 376, 654, 134-D12 (1991)

**Alphanumeric: HH 7–11**

Near-Infrared Emission-Line Images of Three Herbig-Haro Objects. *Karl R. Stapelfeldt, Charles A. Beichman, J. Jeff Hester, Nicholas Z. Scoville, & Thomas N. Gautier III.* 371, 226, 63-A1 (1991)

**Alphanumeric: HH 12**

Near-Infrared Emission-Line Images of Three Herbig-Haro Objects. *Karl R. Stapelfeldt, Charles A. Beichman, J. Jeff Hester, Nicholas Z. Scoville, & Thomas N. Gautier III.* 371, 226, 63-A1 (1991)

**Alphanumeric: HH 34**

Near-Infrared Emission-Line Images of Three Herbig-Haro Objects. *Karl R. Stapelfeldt, Charles A. Beichman, J. Jeff Hester, Nicholas Z. Scoville, & Thomas N. Gautier III.* 371, 226, 63-A1 (1991)

**Alphanumeric: IC 443**

H<sub>2</sub>CO in IC 443G: Unusual Excitation and a Diagnostic of Shock Astrochemistry. *B. E. Turner & D. A. Lubowich.* 381, 173, 191-B9 (1991)

Forbidden Iron Emission on the North Rim of IC 443. *Richard G. Teske.* 383, 233, 215-A1 (1991)

**Alphanumeric: IC 446**

Emission from Dust in Visual Reflection Nebulae at Infrared and Submillimeter Wavelengths. *Sean C. Casey.* 371, 183, 62-D1 (1991)

**Alphanumeric: IC 1396**

A Search for Embedded Young Stellar Objects in and near the IC 1396 Complex. *Richard D. Schwartz, Armen L. Gyulbudaghian, & Bruce A. Wilking.* 370, 263, 50-D9 (1991)

**Alphanumeric: IRAS 22272+5435**

The Carbon-rich Proto-Planetary Nebula IRAS 22272+5435. *Bruce J. Hrivnak & Sun Kwok.* 371, 631, 69-D6 (1991)

**Alphanumeric: K3-50**

Far-Infrared Lines from G45.13+0.14 A and K3-50 A: Density Fluctuations in Compact H II Regions. *Sean W. J. Colgan, J. P. Simpson, Robert H. Rubin, Edwin F. Erickson, M. R. Haas, & Jürgen Wolf.* 366, 172, 3-B13 (1991)

**Alphanumeric: L134 (Lynds 134)**

IRAS Detection of Very Cold Dust in the Lynds 134 Cloud Complex. *R. J. Laureij, F. O. Clark, & T. Prusti.* 372, 185, 76-C4 (1991)

**Alphanumeric: L723 (Lynds 723)**

A Double Radio Source at the Center of the Outflow in L723. *Guillem Anglada, Robert Estalella, Luis F. Rodríguez, José M. Torrelles, Rosario López, & Jorge Cantó.* 376, 615, 134-A7 (1991)

Molecular Observations of the L723 Region: Interaction between the Clumpy Outflow and the Gaseous Core? *Saeko S. Hayashi, Tetsuo Hasegawa, & Norio Kaifu.* 377, 492, 145-G5 (1991)

**Alphanumeric: L1221 (Lynds 1221)**

U-shaped Outflow in the Lynds 1221 Dark Cloud: An Example of Interaction of Outflows with Ambient Molecular Clouds. *Tomofumi Umemoto, Naomi Hirano, Osamu Kameya, Yasuo Fukui, Nario Kuno, & Keiya Takakubo.* 377, 510, 146-A13 (1991)

**Alphanumeric: L1287 (Lynds 1287)**

A Millimeter-Wave Line Study of L1287: A Case of Induced Star Formation by Stellar Wind Compression? *Ji Yang, Tomofumi Umemoto, Takahiro Iwata, & Yasuo Fukui.* 373, 137, 87-F7 (1991)

**Alphanumeric: L1457 (Lynds 1457)**

An X-Ray Pulsator in the Direction of Molecular Cloud MBM 12 (Lynds 1457). *K. Koyama, S. Takano, Y. Tawara, T. Matsumoto, K. Noguchi, Y. Fukui, T. Iwata, N. Ohashi, K. Tatematsu, N. Takahashi, T. Umemoto, K. W. Hodapp, J. Rayner, & K. Makishima.* 377, 240, 141-A1 (1991)

**Alphanumeric: L1489 (Lynds 1489)**

Two Micron Morphology of Candidate Protostars. *Motohide Tamura, Ian Gatley, William Waller, & Michael W. Werner.* 374, L25, 103-E7 (1991)

**Alphanumeric: L1536 (Lynds 1536)**

Two Micron Morphology of Candidate Protostars. *Motohide Tamura, Ian Gatley, William Waller, & Michael W. Werner.* 374, L25, 103-E7 (1991)

**Alphanumeric: L1551 (Lynds 1551)**

Two Micron Morphology of Candidate Protostars. *Motohide Tamura, Ian Gatley, William Waller, & Michael W. Werner.* 374, L25, 103-E7 (1991)

Testing Models of Low-Mass Star Formation: High-Resolution Far-Infrared Observations of L1551 IRS 5. *Harold M. Butner, Neal J. Evans II, Daniel F. Lester, Russell M. Levreault, & Stephen E. Strom.* 376, 636, 134-C6 (1991)

Two New Molecular Outflows in L1551? *Marc W. Pound & John Bally.* 383, 705, 223-A7 (1991)

**Alphanumeric: L1551 IRS 5 (Lynds 1551 IRS 5)**

A Second Outflow from L1551/IRS 5? *G. H. Moriarty-Schieven & P. G. Wannier.* 373, L23, 91-C8 (1991)

**Alphanumeric: L1563 (Lynds 1563)**

Dust and Molecular Properties of the Low-Opacity Cloud Lynds 1563.  
*Frank O. Clark, R. J. Laureijs, & Lauri L. Wardell.* 370, 237, 50-B7 (1991)

**Alphanumeric: L1630 (Lynds 1630)**

An Unbiased Survey for Dense Cores in the Lynds 1630 Molecular Cloud.  
*Elizabeth A. Lada, John Bally, & Antony A. Stark.* 368, 432, 30-D9 (1991)

A 2.2 Micron Survey in the L1630 Molecular Cloud.  
*Elizabeth A. Lada, D. L. DePoy, Neal J. Evans II, & Ian Gailley.* 371, 171, 62-C1 (1991)

**Alphanumeric: L1641 (Lynds 1641)**

Molecular Outflows in the L1641 Region of Orion.  
*James A. Morgan & John Bally.* 372, 505, 82-B1 (1991)

Molecular Outflows Associated with Young Stellar Objects in the L1641 Region of Orion.  
*James A. Morgan, F. Peter Schloerb, Ronald L. Snell, & John Bally.* 376, 618, 134-A12 (1991)

**Alphanumeric: LMC N132D**

The Young Supernova Remnants N132D and 1E 0102.2-7219: Limits on the Presence of Rapidly Moving Sulfur.  
*Barry M. Lasker & David A. Golimowski.* 371, 568, 68-E8 (1991)

**Alphanumeric: M1-91**

Proto-Planetary Nebulae. I. The Extreme Bipolar Nebulae M2-9 and M1-91.  
*Robert W. Goodrich.* 366, 163, 3-B1 (1991)

**Alphanumeric: M1-92**

OH Emission and the Nature of Minkowski's Footprint (M1-92).  
*E. R. Seauquist, René Plume, & L. E. Davis.* 367, 200, 14-E5 (1991)

**Alphanumeric: M2-9**

Proto-Planetary Nebulae. I. The Extreme Bipolar Nebulae M2-9 and M1-91.  
*Robert W. Goodrich.* 366, 163, 3-B1 (1991)

**Alphanumeric: M2-19**

Two Planetary Nebulae in the Direction of the Galactic Center.  
*A. Gutiérrez-Moreno, H. Moreno, & G. Cortés.* 383, 174, 214-C1 (1991)

**Alphanumeric: M2-56**

Proto-Planetary Nebulae. II. The Shock-heated Bipolar Nebulae GL 618 and M2-56.  
*Robert W. Goodrich.* 376, 654, 134-D12 (1991)

**Alphanumeric: M3-44**

Two Planetary Nebulae in the Direction of the Galactic Center.  
*A. Gutiérrez-Moreno, H. Moreno, & G. Cortés.* 383, 174, 214-C1 (1991)

**Alphanumeric: SN 1987A**

Supernova Remnant 1987A.  
*Ding Luo & Richard McCray.* 372, 194, 76-D1 (1991)

The Circumstellar Shell of SN 1987A.  
*Ding Luo & Richard McCray.* 379, 659, 172-G9 (1991)

**Alphanumeric: TMC-1**

Detection of a New Carbon-Chain Molecule, CCO.  
*Masatoshi Ohishi, Hiroko Suzuki, Shin-ichi Ishikawa, Chikashi Yamada, Hideyo Kanamori, William M. Irvine, Ronald D. Brown, Peter D. Godfrey, & Norio Kaifu.* 380, L39, 181-E11 (1991)

**Alphanumeric: W3**

Parsec-Scale Penetration of Ultraviolet Photons into Molecular Clouds: [C II] 158 Micron Mapping of W3, NGC 1977, and NGC 2023.  
*J. E. Howe, D. T. Jaffe, R. Genzel, & G. J. Stacey.* 373, 158, 88-A5 (1991)

**Alphanumeric: W28**

W28 and 3C 400.2: Two Shell-like Radio Supernova Remnants with Centrally Peaked X-Ray Morphologies.  
*Knox S. Long, William P. Blair, Richard L. White, & Yutaka Matsui.* 373, 567, 95-A10 (1991)

**Alphanumeric: W49**

A Simulation of the Collapse and Fragmentation of Cooling Molecular Clouds.  
*Joe J. Monaghan & John C. Lattanzio.* 375, 177, 113-C1 (1991)

Gravitational Fragmentation: A Comparison with W49A.  
*Eric R. Keto, John C. Lattanzio, & Joe J. Monaghan.* 383, 639, 222-B12 (1991)

**Alphanumeric: W51**

Pumping the Interstellar (6,3) Ammonia Maser.  
*Ronald D. Brown & Dinah M. Cragg.* 378, 445, 156-D10 (1991)

**NEBULAE: INTERNAL MOTIONS**

Proto-Planetary Nebulae. I. The Extreme Bipolar Nebulae M2-9 and M1-91.  
*Robert W. Goodrich.* 366, 163, 3-B1 (1991)

A Spectroscopic Study of the DR 21 Outflow Source. II. The Vibrational H<sub>2</sub> Line Emission.  
*R. P. Garden, T. R. Geballe, I. Gailley, & D. Nadeau.* 366, 474, 8-G1 (1991)

A Detailed Optical Study of Kepler's Supernova Remnant.  
*William P. Blair, Knox S. Long, & Olaf Vancura.* 366, 484, 9-A1 (1991)

Superbubble Blowout in the Giant H II Region NGC 2363?  
*Jean-René Roy, J. Boulesteix, Gilles Joncas, & B. Grundseth.* 367, 141, 13-F8 (1991)

OH Emission and the Nature of Minkowski's Footprint (M1-92).  
*E. R. Seauquist, René Plume, & L. E. Davis.* 367, 200, 14-E5 (1991)

The Structure and Kinematics of Bipolar Outflows: Observations and Models of the Monoceros R2 Outflow.  
*Barry A. Meyers-Rice & Charles J. Lada.* 368, 445, 30-E10 (1991)

Star Formation and the Nature of Bipolar Outflows.  
*Frank H. Shu, Steven P. Ruden, Charles J. Lada, & Susana Lizano.* 370, L31, 53-E1 (1991)

The Spectral Signatures of Collapse and Outflow around Young Stars.  
*E. R. Keto.* 371, 163, 62-B3 (1991)

Episodic Outflows from High-Mass Protostars.  
*G. F. Mitchell, J.-P. Maillard, & T. I. Hasegawa.* 371, 342, 64-D1 (1991)

The Dynamics and Physical Properties of the Cometary Nebula G29.96-0.02.  
*Douglas O. S. Wood & Ed Churchwell.* 372, 199, 76-D8 (1991)

Molecular Outflows in the L1641 Region of Orion.  
*James A. Morgan & John Bally.* 372, 505, 82-B1 (1991)

CS Multitransitional Studies of Density Distribution in Star-forming Regions. I. The NGC 2071 Region.  
*Shudong Zhou, Neal J. Evans II, Rolf Güsten, Lee G. Mundy, & Marc L. Kutner.* 372, 518, 82-C1 (1991)

Dynamical Evolution and Molecular Abundances of Interstellar Clouds.  
*Sheo S. Prasad, Karen R. Heere, & Shankar P. Tarafdar.* 373, 123, 87-E5 (1991)

A Second Outflow from L1551/IRS 5?  
*G. H. Moriarty-Schieven & P. G. Wannier.* 373, L23, 91-C8 (1991)

W28 and 3C 400.2: Two Shell-like Radio Supernova Remnants with Centrally Peaked X-Ray Morphologies.  
*Knox S. Long, William P. Blair, Richard L. White, & Yutaka Matsui.* 373, 567, 95-A10 (1991)

Observations of HCO<sup>+</sup> in B335.  
*Tatsuhiro I. Hasegawa, C. Rogers, & Saeko Suzuki Hayashi.* 374, 177, 100-C1 (1991)

Changes in the Optical Remnant of Kepler's Supernova during the Period 1942-1989.  
*Rino Bandiera & Sidney van den Bergh.* 374, 186, 100-C11 (1991)

A Spectroscopic Study of the DR 21 Outflow Source. III. The CO Line Emission.  
*R. P. Garden, M. Hayashi, I. Gailley, T. Hasegawa, & N. Kaifu.* 374, 540, 105-G11 (1991)

Spectroscopic Study of Direct and Dust-scattered Line Emission in the HH 1-HH 2 System.  
*J. Solf & K. H. Böhm.* 375, 618, 120-D3 (1991)

The Smoothness of CO Line Profiles in Orion: Implications for Clumpiness.  
*Jan A. Tauber, Paul F. Goldsmith, & Robert L. Dickman.* 375, 635, 120-E7 (1991)

Six Balmer-dominated Supernova Remnants.  
*R. Chris Smith, Robert P. Kirshner, William P. Blair, & P. Frank Winkler.* 375, 652, 120-G1 (1991)

Anatomy of the Barnard 5 Core.  
*G. A. Fuller, P. C. Myers, W. J. Welch, P. F. Goldsmith, W. D. Langer, B. G. Campbell, S. Guilloteau, & R. W. Wilson.* 376, 135, 126-E10 (1991)

The Multiple-Shell Structure of the Planetary Nebula NGC 6751.  
*You-Hua Chu, Arturo Manchado, George H. Jacoby, & Karen B. Kwinter.* 376, 150, 126-F13 (1991)

Molecular Observations of the L723 Region: Interaction between the Clumpy Outflow and the Gaseous Core?  
*Saeko S. Hayashi, Tetsuo Hasegawa, & Norio Kaifu.* 377, 492, 145-G5 (1991)

U-shaped Outflow in the Lynds 1221 Dark Cloud: An Example of Interaction of Outflows with Ambient Molecular Clouds.  
*Tomofumi Umemoto, Naomi Hirano, Osamu Kameya, Yasuo Fukui, Nario Kuno, & Keiya Takakubo.* 377, 510, 146-A13 (1991)

Kinematic Models of Maser Shells Formed by Aspherical Stellar Outflows (U Orionis; OH 231.8+4.2; Orion-IRc2).  
*P. F. Bowers.* 76, 1099, 40-G9 (1991)

- The Velocity Dispersion of Giant Molecular Clouds. II. Mathematical and Numerical Refinements.** Charles F. Gammie, Jeremiah P. Ostriker, & Chanda J. Jog. 378, 565, 159-D5 (1991)
- SiS in Outflow Regions: More High-Temperature Silicon Chemistry.** L. M. Ziurys. 379, 260, 166-C7 (1991)
- CO  $J = 3-2$  and  $J = 2-1$  Observations of NGC 7027.** P. A. Jaminet, W. C. Danchi, E. C. Sutton, A. P. G. Russell, Göran Sandell, J. H. Bieging, & D. Wilner. 380, 461, 184-A4 (1991)
- X Marks the Spot: Distribution and Excitation of Unidentified Molecules in the Red Rectangle.** Gary D. Schmidt & Adolf N. Witt. 383, 698, 222-G12 (1991)
- Two New Molecular Outflows in L1551?** Marc W. Pound & John Bally. 383, 705, 223-A7 (1991)
- NEBULAE ORION NEBULA**
- Water Vapor in the Orion Molecular Cloud.** R. F. Knacke & H. P. Larson. 367, 162, 14-A10 (1991)
- Fossil DCN in Orion-KL.** Jeffrey G. Mangum, Richard L. Plambeck, & Alwyn Wootten. 369, 169, 38-A11 (1991)
- Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0''.1.** J. Jeff Hester, R. Gilmozzi, C. R. O'Dell, S. M. Faber, Bel Campbell, Arthur Code, Douglas G. Currie, G. Edward Danielson, S. P. Ewald, Edward J. Groth, Jon A. Holtzman, T. Kelsall, Tod R. Lauer, Robert M. Light, Roger Lynds, Earl J. O'Neil, Jr., Edward J. Shaya, & James A. Westphal. 369, L75, 46-C7 (1991)
- Polarimetric Mapping of Orion Using MILLIPOL: Magnetic Activity in BN/KL.** Robert W. Leach, Dan P. Clemens, Brian D. Kane, & Richard Barvainis. 370, 257, 50-D1 (1991)
- $N_2H^+$  in Orion: Chemical Clues to the Dynamics of the Quiescent Gas.** M. Womack, L. M. Ziurys, & S. Wyckoff. 370, L99, 59-F1 (1991)
- Detection of Low-J Pure-Rotational Emission from  $H_2$  in the Orion Bar Region: Evidence for Small-Scale Clumpiness.** Parvinder S. Parnar, John H. Lacy, & Jeffrey M. Achtermann. 372, L25, 79-D1 (1991)
- Observations of [Si II] (35 Micron) and [S I] (25 Micron) in Orion: Evidence for a Wind Shock near IRC2.** Michael R. Haas, David Hollenbach, & Edwin F. Erickson. 374, 555, 106-B1 (1991)
- Axisymmetric Model of the Ionized Gas in the Orion Nebula.** R. H. Rubin, J. P. Simpson, M. R. Haas, & E. F. Erickson. 374, 564, 106-B12 (1991)
- Physical Conditions in the Orion Nebula and an Assessment of Its Helium Abundance.** Jack A. Baldwin, Gary J. Ferland, P. G. Martin, Michael R. Corbin, Stephen A. Cota, Bradley M. Peterson, & Arne Stetebrek. 374, 580, 106-D1 (1991)
- A Molecular Line Survey of Sagittarius B2 and Orion-KL from 70 to 115 GHz. II. Analysis of the Data.** B. E. Turner. 76, 617, 33-D1 (1991)
- Molecular Hydrogen Polarization Images of OMC-1.** Michael G. Burton, N. R. Minchin, J. H. Hough, C. Aspin, D. J. Axon, & J. A. Bailey. 375, 611, 120-C9 (1991)
- The Optical Depth of the 158 Micron [ $^{12}C\text{ II}$ ] Line: Detection of the  $F = 1 \rightarrow 0$  [ $^{13}C\text{ II}$ ] Hyperfine-Structure Component.** G. J. Stacey, C. H. Townes, A. Poglitsch, S. C. Madden, J. M. Jackson, F. Herrmann, R. Genzel, & N. Geis. 382, L37, 205-E1 (1991)
- NEBULAE: PLANETARY**
- Proto-Planetary Nebulae. I. The Extreme Bipolar Nebulae M2-9 and M1-91.** Robert W. Goodrich. 366, 163, 3-B1 (1991)
- Photoionization Modeling of Magellanic Cloud Planetary Nebulae. I.** M. A. Dopita & S. J. Meatheringham. 367, 115, 13-D6 (1991)
- NGC 6302: Ionized by a Very Hot Star or by a Wind?** N. J. Lane & G. J. Ferland. 367, 208, 14-F1 (1991)
- Emission Features in the Spectrum of NGC 7027 near 3.3 Microns at Very High Resolution.** R. P. Lowe, J. M. Moorhead, W. H. Wehlau, & J.-P. Maillard. 368, 195, 25-E1 (1991)
- The Dynamic Instability of Adiabatic Blast Waves.** Dongsu Ryu & Ethan T. Vishniac. 368, 411, 30-B12 (1991)
- Near-Infrared Spectroscopy of the Planetary Nebula NGC 6572.** Richard J. Rudy, George S. Rossano, Peter Erwin, & R. C. Puettner. 368, 468, 30-G13 (1991)
- Relative Populations for Levels in the  $3d^2$  Ground Configuration of Fe VII.** F. P. Keenan & P. H. Norrington. 368, 486, 31-B7 (1991)
- Optical Spectroscopy of Magellanic Cloud Planetary Nebulae. I.** Stephen J. Meatheringham & Michael A. Dopita. 75, 407, 6-C9 (1991)
- The Infrared Properties of Compact Galactic Radio Sources: The Young and the Restless.** Richard L. White, Robert H. Becker, & David J. Helfand. 371, 148, 62-A1 (1991)
- The Ionization Structure of Planetary Nebulae. X. NGC 2392.** Timothy Barker. 371, 217, 62-G5 (1991)
- Echelle Spectroscopy of CD -41° 13967: The Young Central Star of a New Planetary Nebula.** James K. McCarthy, R. Michael Rich, S. R. Becker, K. Butler, D. Husfeld, & H. G. Groth. 371, 380, 64-G1 (1991)
- The Carbon-rich Proto-Planetary Nebula IRAS 22272+5435.** Bruce J. Hrivnak & Sun Kwok. 371, 631, 69-D6 (1991)
- Ne V in Planetary Nebulae.** F. P. Keenan, V. M. Burke, & K. M. Aggarwal. 371, 636, 69-D13 (1991)
- Nitrogen Abundances in Carbon-rich Stars That Are Progenitors to Planetary Nebulae.** M. Jura. 372, 208, 76-E7 (1991)
- Central Star Temperatures of Low-Excitation Planetary Nebulae.** James B. Kaler & George H. Jacoby. 372, 215, 76-F1 (1991)
- Ultraviolet High-Excitation Fe II Fluorescence Lines Excited by O VI, C IV, and H I Resonance Emission As Seen in IUE Spectra.** Walter A. Feibelman, Frederick C. Bruhweiler, & Sveneric Johansson. 373, 649, 96-A8 (1991)
- Spatial Studies of Planetary Nebulae with IRAS.** G. W. Hawkins & B. Zuckerman. 374, 227, 100-G11 (1991)
- LMC SMP 64: The Youngest Planetary Nebula?** M. A. Dopita & S. J. Meatheringham. 374, L21, 103-E1 (1991)
- Chemical Abundances in Planetary Nebulae: Basic Data and Correlations between Elements.** M. Perinotto. 76, 687, 34-C9 (1991)
- Near-Infrared Emission of Neutral Carbon from Photon-dominated Regions.** V. Escalante, A. Sternberg, & A. Dalgarno. 375, 630, 120-E1 (1991)
- The Multiple-Shell Structure of the Planetary Nebula NGC 6751.** You-Hua Chu, Arturo Manchado, George H. Jacoby, & Karen B. Krwitter. 376, 150, 126-F13 (1991)
- The Spectrum of NGC 7027 from 3080 to 2630 Wavenumbers (3.25–3.80 Microns): Detection of New Atomic and Molecular Hydrogen Lines and New Constraints on the Chemical Sidegroups on Polycyclic Aromatic Hydrocarbons.** Scott A. Sandford. 376, 599, 133-G1 (1991)
- Proto-Planetary Nebulae. II. The Shock-heated Bipolar Nebulae GL 618 and M2-56.** Robert W. Goodrich. 376, 654, 134-D12 (1991)
- Neutral Oxygen in Planetary Nebulae: Probing Radiative Transfer and Nebular Structure.** Michael G. Richer, Marshall L. McCall, & Peter G. Martin. 377, 210, 140-E1 (1991)
- Ultraviolet Fe VII Absorption and Fe II Emission Lines of Central Stars of Planetary Nebulae.** Kwang-Ping Cheng, Walter A. Feibelman, & Frederick C. Bruhweiler. 377, 235, 140-G7 (1991)
- Photoionization Modeling of Magellanic Cloud Planetary Nebulae. II.** M. A. Dopita & S. J. Meatheringham. 377, 480, 145-F6 (1991)
- Optical Spectroscopy of Magellanic Cloud Planetary Nebulae. II.** Stephen J. Meatheringham & Michael A. Dopita. 76, 1085, 40-F7 (1991)
- High-Resolution Radio Continuum Observations of Compact Planetary Nebulae.** O. B. Aaquist & Sun Kwok. 378, 599, 159-G1 (1991)
- A Grain-heated, Dusty Planetary Nebula in M22.** Kazimierz J. Borkowski & J. Patrick Harrington. 379, 168, 165-B1 (1991)
- The Molecular Envelope of NGC 7027.** John H. Bieging, David Wilner, & Harley A. Thronson, Jr. 379, 271, 166-D9 (1991)
- The 0.46–1.3 Micron Spectrum of the Planetary Nebula BD +30°3639.** Richard J. Rudy, Ross D. Cohen, George S. Rossano, Peter Erwin, R. C. Puettner, & David K. Lynch. 380, 151, 178-A1 (1991)
- CO  $J = 3-2$  and  $J = 2-1$  Observations of NGC 7027.** P. A. Jaminet, W. C. Danchi, E. C. Sutton, A. P. G. Russell, Göran Sandell, J. H. Bieging, & D. Wilner. 380, 461, 184-A4 (1991)
- Core Masses and Abundances of Low-Excitation Planetary Nebulae in the Magellanic Clouds.** James B. Kaler & George H. Jacoby. 382, 134, 201-G7 (1991)
- Deep VLA Images of Globular Clusters.** Helen M. Johnston, Shrinivas R. Kulkarni, & W. M. Goss. 382, L89, 211-D11 (1991)

**Two Planetary Nebulae in the Direction of the Galactic Center.** *A. Guijérrez-Moreno, H. Moreno, & G. Cortés.* 383, 174, 214-C1 (1991)

**Planetary Nebulae as Standard Candles. VII. A Test versus Hubble Type in the NGC 1023 Group.** *Robin Ciardullo, George H. Jacoby, & William E. Harris.* 383, 487, 220-D1 (1991)

**About the Stage of Evolution of Wolf-Rayet Stars.** *Anne B. Underhill.* 383, 729, 223-C6 (1991)

#### NEBULAE: REFLECTION

**IRAS 23545+6508, a Dissociating Star: Prototype for a New Observational Class?** *P. E. Dewdney, R. S. Roger, C. R. Purton, & W. H. McCutcheon.* 370, 243, 50-C1 (1991)

**Emission from Dust in Visual Reflection Nebulae at Infrared and Submillimeter Wavelengths.** *Sean C. Casey.* 371, 183, 62-D1 (1991)

**Two Micron Morphology of Candidate Protostars.** *Motohide Tamura, Ian Gatley, William Waller, & Michael W. Werner.* 374, L25, 103-E7 (1991)

**Infrared Polarization Images of Star-forming Regions. I. The Ubiquity of Bipolar Structure.** *M. Tamura, Ian Gatley, R. R. Joyce, M. Ueno, H. Suto, & M. Sekiguchi.* 378, 611, 160-A1 (1991)

**X Marks the Spot: Distribution and Excitation of Unidentified Molecules in the Red Rectangle.** *Gary D. Schmidt & Adolf N. Witt.* 383, 698, 222-G12 (1991)

#### NEBULAE: STRUCTURE

**Proto-Planetary Nebulae. I. The Extreme Bipolar Nebulae M2-9 and M1-91.** *Robert W. Goodrich.* 366, 163, 3-B1 (1991)

**Far-Infrared Observations and the Structure of Wolf-Rayet Ring Nebulae.** *A. P. Marston.* 366, 181, 3-C9 (1991)

**Faraday Rotation and Physical Conditions in the Crab Nebula.** *M. F. Bietenholz & P. P. Kronberg.* 368, 231, 26-A1 (1991)

**An Unbiased Survey for Dense Cores in the Lynds 1630 Molecular Cloud.** *Elizabeth A. Lada, John Bally, & Antony A. Stark.* 368, 432, 30-D9 (1991)

**Observations of  $^{12}\text{CO}$  and  $^{13}\text{CO}$  J = 9–8 in Galactic Molecular Clouds.** *R. T. Boreiko & A. L. Betz.* 369, 382, 42-E1 (1991)

**Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0''.1.** *J. Jeff Hester, R. Gilmozzi, C. R. O'Dell, S. M. Faber, Bel Campbell, Arthur Code, Douglas G. Currie, G. Edward Danielson, S. P. Ewald, Edward J. Groth, Jon A. Holtzman, T. Kelsall, Tod R. Lauer, Robert M. Light, Roger Lynds, Earl J. O'Neil, Jr., Edward J. Shaya, & James A. Westphal.* 369, L75, 46-C7 (1991)

**An X-Ray Image of the Violent Interstellar Medium in 30 Doradus.** *Q. Wang & D. J. Helfand.* 370, 541, 55-B9 (1991)

**Narrow-Band Imaging of the Inner R Aquarii Nebula: Further Evidence for Shock Excitation.** *Denis Burgarella & Francesco Paresce.* 370, 590, 55-G1 (1991)

**New Clues to the Cassiopeia A Supernova Progenitor.** *Robert A. Fesen & Robert H. Becker.* 371, 621, 69-C4 (1991)

**CS Multitransitional Studies of Density Distribution in Star-forming Regions. I. The NGC 2071 Region.** *Shudong Zhou, Neal J. Evans II, Rolf Güsten, Lee G. Mundy, & Marc L. Kutner.* 372, 518, 82-C1 (1991)

**Dynamical Evolution and Molecular Abundances of Interstellar Clouds.** *Sheo S. Prasad, Karen R. Heere, & Shankar P. Tarafdar.* 373, 123, 87-E5 (1991)

**Probing the Core of Cepheus A: Millimeter and Submillimeter Observations.** *G. H. Moriarty-Schieven, R. L. Snell, & V.A. Hughes.* 374, 169, 100-B3 (1991)

**Observations of  $\text{HCO}^+$  in B335.** *Tatsuhiko I. Hasegawa, C. Rogers, & Saeko Suzuki Hayashi.* 374, 177, 100-C1 (1991)

**A New Look at the "Jet" in the CTB 37A/B Supernova Remnant Complex.** *Namir E. Kissim, Stefi A. Baum, & Kurt W. Weiler.* 374, 212, 100-F9 (1991)

**Axisymmetric Model of the Ionized Gas in the Orion Nebula.** *R. H. Rubin, J. P. Simpson, M. R. Haas, & E. F. Erickson.* 374, 564, 106-B12 (1991)

**A Simulation of the Collapse and Fragmentation of Cooling Molecular Clouds.** *Joe J. Monaghan & John C. Lattanzio.* 375, 177, 113-C1 (1991)

**Spectroscopic Study of Direct and Dust-scattered Line Emission in the HH 1-HH 2 System.** *J. Solf & K. H. Böhm.* 375, 618, 120-D3 (1991)

**Anatomy of the Barnard 5 Core.** *G. A. Fuller, P. C. Myers, W. J. Welch, P. F. Goldsmith, W. D. Langer, B. G. Campbell, S. Guilloteau, & R. W. Wilson.* 376, 135, 126-E10 (1991)

**The Multiple-Shell Structure of the Planetary Nebula NGC 6751.** *You-Hua Chu, Arturo Manchado, George H. Jacoby, & Karen B. Kwitter.* 376, 150, 126-F13 (1991)

**Dense Cores in Dark Clouds. VI. Shapes.** *P. C. Myers, G. A. Fuller, A. A. Goodman, & P. J. Benson.* 376, 561, 133-D1 (1991)

**Neutral Oxygen in Planetary Nebulae: Probing Radiative Transfer and Nebular Structure.** *Michael G. Richer, Marshall L. McCall, & Peter G. Martin.* 377, 210, 140-E1 (1991)

**Ultraviolet and Optical Spectroscopy of the R Aquarii Symmetrical Jet.** *J. M. Hollis, R. J. Oliversen, M. Kafatos, A. G. Michalitsianos, & R. M. Wagner.* 377, 227, 140-F11 (1991)

**The Edges of Molecular Clouds: Fractal Boundaries and Density Structure.** *E. Falgarone, T. G. Phillips, & C. K. Walker.* 378, 186, 153-C8 (1991)

**High-Resolution Radio Continuum Observations of Compact Planetary Nebulae.** *O. B. Aaquist & Sun Kwok.* 378, 599, 159-G1 (1991)

**Infrared Polarization Images of Star-forming Regions. I. The Ubiquity of Bipolar Structure.** *M. Tamura, Ian Gatley, R. R. Joyce, M. Ueno, H. Suto, & M. Sekiguchi.* 378, 611, 160-A1 (1991)

**The Collimation of a Time-dependent Stellar Wind.** *S.-H. Kim & A. C. Raga.* 379, 689, 173-C4 (1991)

**Radial Dust Density Profiles in Small Molecular Clouds.** *João Lin Yun & Dan P. Clemens.* 381, 474, 196-E7 (1991)

**A Study of  $^{13}\text{CO}$  Cloud Cores in Ophiuchus.** *S. Nozawa, A. Mizuno, Y. Teshima, H. Ogawa, & Y. Fukui.* 77, 647, 53-E6 (1991)

#### NEBULAE: SUPERNOVA REMNANTS

**A Detailed Optical Study of Kepler's Supernova Remnant.** *William P. Blair, Knox S. Long, & Olaf Vancura.* 366, 484, 9-A1 (1991)

**The Proper Motion of the Soft X-Ray-emitting Radio Pulsar PSR 0656+14.** *R. J. Thompson, Jr., F. A. Córdova, R. M. Hjelming, & E. B. Fomalont.* 366, L83, 11-E1 (1991)

**Simulations of the Supernova-dominated Interstellar Medium in Disk Galaxies.** *Denis F. Cioffi & J. Michael Shull.* 367, 96, 13-B13 (1991)

**An Infrared Analysis of Puppis A.** *Richard G. Arendt, Eli Dwek, & Robert Petre.* 368, 474, 31-A7 (1991)

**Magnetic Focusing of Precessing Jets.** *Christopher S. Kochanek.* 371, 289, 63-F7 (1991)

**The Young Supernova Remnants N132D and 1E 0102.2–7219: Limits on the Presence of Rapidly Moving Sulfur.** *Barry M. Lasker & David A. Golimowski.* 371, 568, 68-E8 (1991)

**New Clues to the Cassiopeia A Supernova Progenitor.** *Robert A. Fesen & Robert H. Becker.* 371, 621, 69-C4 (1991)

**Supernova Remnant 1987A.** *Ding Luo & Richard McCray.* 372, 194, 76-D1 (1991)

**Spectra of Two Very Old Supernovae: SN 1986J and SN 1980K.** *Bruno Leibundgut, Robert P. Kirshner, Philip A. Pinto, Michael P. Rupen, R. Chris Smith, James A. Gunn, & Donald P. Schneider.* 372, 531, 82-D1 (1991)

**Discovery of a Young, 267 Millisecond Pulsar in the Supernova Remnant W44.** *A. Wolszczan, J. M. Cordes, & R. J. Dewey.* 372, L99, 85-F1 (1991)

**Relativistic Electron Populations in Cassiopeia A.** *M. Anderson, L. Rudnick, P. Leppek, R. Perley, & R. Braun.* 373, 146, 87-G4 (1991)

**The Detection of X-Ray Emission from the OB Associations of the Large Magellanic Cloud.** *Q. Wang & D. J. Helfand.* 373, 497, 94-B7 (1991)

**Supernova Remnant Evolution in an Interstellar Medium with Evaporating Clouds.** *Richard L. White & Knox S. Long.* 373, 543, 94-F7 (1991)

**W28 and 3C 400.2: Two Shell-like Radio Supernova Remnants with Centrally Peaked X-Ray Morphologies.** *Knox S. Long, William P. Blair, Richard L. White, & Yutaka Matsui.* 373, 567, 95-A10 (1991)

**The Expansion of the Crab Nebula.** *M. F. Bietenholz, P. P. Kronberg, D. E. Hogg, & A. S. Wilson.* 373, L59, 97-D5 (1991)

- Changes in the Optical Remnant of Kepler's Supernova during the Period 1942–1989.** *Rino Bandiera & Sidney van den Bergh.* 374, 186, 100–C1 (1991)
- Far-Ultraviolet Mapping of the Cygnus Loop with the Voyager 2 Ultraviolet Spectrometer.** *William P. Blair, Knox S. Long, Olaf Vancura, & J. B. Holberg.* 374, 202, 100–E5 (1991)
- A New Look at the "Jet" in the CTB 37A/B Supernova Remnant Complex.** *Namir E. Kassim, Stefi A. Baum, & Kurt W. Weiler.* 374, 212, 100–F9 (1991)
- HEAO 1 A-2 Low-Energy Detector X-Ray Spectra of the Lupus Loop and SN 1006.** *D. A. Leahy, J. Nousek, & A. J. S. Hamilton.* 374, 218, 100–G1 (1991)
- Six Balmer-dominated Supernova Remnants.** *R. Chris Smith, Robert P. Kirshner, William P. Blair, & P. Frank Winkler.* 375, 652, 120–G1 (1991)
- Does the Vela Pulsar Have "Wisps"?** *M. F. Bietenholz, D. A. Frail, & T. H. Hankins.* 376, L41, 137–C1 (1991)
- A Statistical Study of the Correlation of Galactic Supernova Remnants and Spiral Arms.** *Zongwei Li, J. Craig Wheeler, Frank N. Bash, & W. H. Jefferys.* 378, 93, 152–B9 (1991)
- Cosmic-Ray Transport and Gamma-Ray Emission in Supernova Shells.** *A. K. Harding, A. Mastichiadis, R. J. Protheroe, & A. P. Szabo.* 378, 163, 153–A9 (1991)
- The O VII Soft X-Ray Spectrum and Its Application to Hot Plasmas in Astrophysics.** *A. H. Gabriel, F. Bely-Dubau, P. Faucher, & L. W. Acton.* 378, 438, 156–D1 (1991)
- Variable Interstellar Absorption toward HD 72127A. II. 1981–1988.** *L. M. Hobbs, R. Ferlet, D. E. Welty, & G. Wallerstein.* 378, 586, 159–F1 (1991)
- The Radio Recovery of SN 1970G in M101.** *John J. Cowan, W. M. Goss, & R. A. Sramek.* 379, L49, 175–B5 (1991)
- The 10 Year Radio Light Curves for SN 1979C.** *Kurt W. Weiler, Schuyler D. Van Dyk, Nino Panagia, Richard A. Sramek, & Jennifer L. Discenna.* 380, 161, 178–B1 (1991)
- A Survey of H I 21 Centimeter Emission Lines toward Supernova Remnants.** *Bon-Chul Koo & Carl Heiles.* 382, 204, 202–F11 (1991)
- Electron Acceleration in a Nonlinear Shock Model with Applications to Supernova Remnants.** *Donald C. Ellison & Stephen P. Reynolds.* 382, 242, 203–C1 (1991)
- Evidence for a Thermally Unstable Shock Wave in the Vela Supernova Remnant.** *John C. Raymond, George Wallerstein, & Bruce Balick.* 383, 226, 214–G5 (1991)
- Forbidden Iron Emission on the North Rim of IC 443.** *Richard G. Teske.* 383, 233, 215–A1 (1991)
- Magnetized Supernova Remnants with Cosmic Rays.** *Katia M. Ferrière & Ellen G. Zweibel.* 383, 602, 221–F11 (1991)
- Supernova Remnants in Dense Clouds. I. Blast-Wave Dynamics and X-Ray Irradiation.** *B. T. Draine & D. T. Woods.* 383, 621, 222–A6 (1991)
- A Kinematic and Proper-Motion Survey of the Cygnus Loop.** *Peter Shull, Jr., & Hans Hippelein.* 383, 714, 223–B3 (1991)
- NEUTRINOS**
- Hollow Galactic Halos of Fermionic Dark Matter.** *John P. Ralston & Lesley L. Smith.* 367, 54, 12–F4 (1991)
- Zero Central Density Solutions of the Anisotropic Jeans Equation and Neutrino Dark Matter.** *Jes Madsen.* 367, 507, 19–F1 (1991)
- Neutrino Oscillations and the Leptonic Charge of the Universe.** *Martin J. Savage, Robert A. Malaney, & George M. Fuller.* 368, 1, 23–B1 (1991)
- Window for the Dark Matter Solution to the Solar Neutrino Problem.** *David Dearborn, Kim Griest, & Georg Raffelt.* 368, 626, 33–A1 (1991)
- Solar-Cycle Modulation of Event Rates in the Chlorine Solar Neutrino Experiment.** *John N. Bahcall & William H. Press.* 370, 730, 57–E1 (1991)
- Numerical Solution of the General Relativistic Boltzmann Equation for Massive and Massless Particles.** *Hugh Harleston & Katherine A. Holcomb.* 372, 225, 76–F13 (1991)
- Oscillations of Rotating Neutron Stars.** *Tod E. Strohmayer.* 372, 573, 82–G5 (1991)
- Single and Binary Star Evolution.** *Icko Iben, Jr.* 76, 55, 24–G3 (1991)
- Voids in a Neutrino-dominated Universe.** *Ning Zeng & Simon D. M. White.* 374, 1, 98–B1 (1991)
- High-Temperature Neutrino-Nucleus Processes in Stellar Collapse.** *George M. Fuller & Bradley S. Meyer.* 376, 701, 135–A12 (1991)
- Does the Solar Interior Rotate Rigidly?** *Andrew Gould.* 377, 707, 148–D7 (1991)
- Neutrino Oscillations and Solar Models.** *C.-X. Chen & M. L. Cherry.* 377, L105, 150–F5 (1991)
- Neutrino-heated Stars and Broad-Line Emission from Active Galactic Nuclei.** *James McDonald, Todor Stanev, & Peter L. Biermann.* 378, 30, 151–D4 (1991)
- A Critical Look at Cosmions.** *Jean Kaplan, François Martin de Volnay, Charling Tao, & Sylviane Turck-Chièze.* 378, 315, 154–G11 (1991)
- Vacuum Ultraviolet Imagery of the Virgo Cluster Region. III. Diffuse Far-Ultraviolet Radiation at High Galactic Latitudes.** *Takashi Onaka & Keiichi Kodaira.* 379, 532, 171–C5 (1991)
- Search for High-Energy Neutrinos from Celestial Sources in the Kolar Gold Fields Experiment.** *H. Adarkar, S. R. Dugad, Y. Hayashi, N. Ito, S. Kawakami, M. R. Krishnaswamy, M. G. K. Menon, S. Miyake, N. K. Mondal, T. Nakamura, V. S. Narasimham, B. V. Sreekantan, & K. Tanaka.* 380, 235, 179–A1 (1991)
- Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.** *M. Aglietta, G. Badino, G. Bologna, C. Castagnoli, A. Castellina, V. L. Dadykin, W. Fulgione, P. Galeotti, F. F. Kalchukov, I. V. Korolkova, P. V. Korochaguin, V. A. Kudryavtsev, A. S. Malguin, L. Periale, V. G. Ryassny, O. G. Ryazhskaya, O. Saavedra, G. Trinchero, S. Vernetto, V. F. Yakushev, & G. T. Zatsepin.* 382, 344, 204–D9 (1991)
- Signatures of Cosmic-Ray Interactions on the Solar Surface.** *D. Seckel, Todor Stanev, & T. K. Gaisser.* 382, 652, 209–F8 (1991)
- Spectral Signatures of the MeV–PeV Radiation from Accreting Neutron Stars.** *B. Rudak & P. Mészáros.* 383, 269, 215–E3 (1991)
- NUCLEAR REACTIONS**
- The s-Process Branchings at  $^{185}\text{W}$  and  $^{186}\text{Re}$ .** *F. Käppeler, S. Jaag, Z. Y. Bao, & G. Reffo.* 366, 605, 10–E5 (1991)
- s-Process Nucleosynthesis in Massive Stars and the Weak Component. I. Evolution and Neutron Captures in a  $25\text{M}_\odot$  Star.** *C. M. Raiteri, M. Busso, R. Gallino, G. Picchio, & L. Pulone.* 367, 228, 14–G13 (1991)
- Cold Nuclear Fusion in Dense Metallic Hydrogen.** *Charles J. Horowitz.* 367, 288, 15–E13 (1991)
- $^{57}\text{Co}$  and  $^{44}\text{Ti}$  Production in SN 1987A.** *S. E. Woosley & Robert D. Hoffman.* 368, L31, 35–B10 (1991)
- Nuclear Reaction Rates in Dense Carbon-Oxygen Mixtures.** *Shuji Ogata, Hiroshi Iyetomi, & Setsuo Ichimaru.* 372, 259, 77–B9 (1991)
- Measurement of the Neutron Capture Rate of the  $^{12}\text{C}(\text{n},\gamma)^{13}\text{C}$  Reaction at Stellar Energy.** *Y. Nagai, M. Igashira, K. Takeda, N. Mukai, S. Motoyama, F. Uesawa, H. Kitazawa, & T. Fukuda.* 372, 683, 84–B7 (1991)
- Photoerosion and the Abundances of  $^7\text{Li}$ ,  $^9\text{Be}$ ,  $^{10}\text{B}$ , and  $^{11}\text{B}$  near Active Galactic Nuclei.** *R. N. Boyd & H. S. Fencl.* 373, 84, 87–A13 (1991)
- A New Site for the Astrophysical Gamma-Process.** *W. Michael Howard, Bradley S. Meyer, & S. E. Woosley.* 373, L5, 91–B1 (1991)
- Thermonuclear Reactions in Dense Stellar Matter: Electron Screening Revisited.** *Setsuo Ichimaru & Shuji Ogata.* 374, 647, 107–B5 (1991)
- Capture Cross Section Measurements of Krypton and Xenon Isotopes and the Fundamental Parameters of the s-Process.** *Hermann Beer.* 375, 823, 122–G7 (1991)
- Neutrino-Nucleus Interactions in Core-Collapse Supernovae.** *Stephen W. Bruenn & W. C. Haxton.* 376, 678, 134–G1 (1991)
- High-Temperature Neutrino-Nucleus Processes in Stellar Collapse.** *George M. Fuller & Bradley S. Meyer.* 376, 701, 135–A12 (1991)
- The  $^{54}\text{Mn}$  Clock and Its Implications for Cosmic-Ray Propagation and Fe Isotope Studies.** *J. E. Grove, B. T. Hayes, R. A. Mewaldt, & W. R. Webber.* 377, 680, 148–B3 (1991)
- An Analytical Formulation of the Double-Pulse s-Process Model.** *Hermann Beer.* 379, 409, 168–B1 (1991)
- A Measurement of the  $^{22}\text{Ne}(\text{n},\gamma)^{23}\text{Ne}$  Capture Cross Section at a Stellar Temperature of  $kT = 25 \text{ keV}$ .** *Hermann Beer, G. Rupp, F. Voss, & F. Käppeler.* 379, 420, 168–C1 (1991)
- On the Sodium Excess in the Atmospheres of Yellow Supergiants.** *N. Prantzos, A. Coc, & J. P. Thibaud.* 379, 729, 173–G1 (1991)

- Capture Rate of the  $^7\text{Li}(n, \gamma)^8\text{Li}$  Reaction by Prompt Gamma-Ray Detection. *Y. Nagai, M. Igashira, N. Mukai, T. Ohsaki, F. Uesawa, K. Takeda, T. Ando, H. Kitazawa, S. Kubono, & T. Fukuda.* 381, 444, 196-C1 (1991)
- Barrier Penetration at Astrophysical Energies. *N. Rowley & A. C. Merchant.* 381, 591, 198-B1 (1991)
- NUCLEOSYNTHESIS**
- On the [O/Fe] versus [Fe/H] Relationship and the Progenitors of Type I Supernovae. *C. Abia, R. Canal, & J. Isern.* 366, 198, 3-E1 (1991)
- Evidence for CNO Processed Material in the Accretion Disk of GP Comae. *T. R. Marsh, Keith Horne, & Simon Rosen.* 366, 535, 9-F1 (1991)
- The *s*-Process Branchings at  $^{185}\text{W}$  and  $^{186}\text{Re}$ . *F. Käppeler, S. Jaag, Z. Y. Bao, & G. Reffo.* 366, 605, 10-E5 (1991)
- s*-Process Nucleosynthesis in Massive Stars and the Weak Component. I. Evolution and Neutron Captures in a  $25 M_{\odot}$  Star. *C. M. Raiteri, M. Busso, R. Gallino, G. Picchio, & L. Pulone.* 367, 228, 14-G13 (1991)
- Neutrino Oscillations and the Leptonic Charge of the Universe. *Martin J. Savage, Robert A. Malaney, & George M. Fuller.* 368, 1, 23-B1 (1991)
- Gamma-Ray Lines from Type I Supernovae. *K. W. Chan & R. E. Lingenfelter.* 368, 515, 31-E1 (1991)
- $^{57}\text{Co}$  and  $^{44}\text{Ti}$  Production in SN 1987A. *S. E. Woosley & Robert D. Hoffman.* 368, L31, 35-B10 (1991)
- The Formation of  $^{26}\text{Al}$  Nova Explosions. *Irit Nofar, Giora Shaviv, & Sumner Starrfield.* 369, 440, 43-B11 (1991)
- Theoretical Light Curve for the Recurrent Nova RS Ophiuchi—Determination of the White Dwarf Mass, Composition, and Distance. *Mariko Kato.* 369, 471, 43-E6 (1991)
- Shock Waves and Nucleosynthesis in Type II Supernovae. *M. B. Aufreiter, E. Baron, & F.-K. Thielemann.* 370, 630, 56-C8 (1991)
- Solar-Cycle Modulation of Event Rates in the Chlorine Solar Neutrino Experiment. *John N. Bahcall & William H. Press.* 370, 730, 57-E1 (1991)
- Primordial  $^4\text{He}$  as a Test of Big Bang Nucleosynthesis. *G. M. Fuller, R. N. Boyd, & J. D. Kalen.* 371, L11, 66-B7 (1991)
- The Shock Process and Light-Element Production in Supernova Envelopes. *Lawrence E. Brown, David S. Dearborn, David N. Schramm, Jon T. Larsen, & Shin Kurokawa.* 371, 648, 69-F1 (1991)
- s*-Process Nucleosynthesis in Massive Stars and the Weak Component. II. Carbon Burning and Galactic Enrichment. *C. M. Raiteri, M. Busso, R. Gallino, & G. Picchio.* 371, 665, 69-G6 (1991)
- Signatures of Inhomogeneity in the Early Universe. *Lawrence H. Kawano, William A. Fowler, Ralph W. Kavanagh, & Robert A. Malaney.* 372, 1, 74-A11 (1991)
- Measurement of the Neutron Capture Rate of the  $^{12}\text{C}(n, \gamma)^{13}\text{C}$  Reaction at Stellar Energy. *Y. Nagai, M. Igashira, K. Takeda, N. Mukai, S. Motoyama, F. Uesawa, H. Kitazawa, & T. Fukuda.* 372, 683, 84-B7 (1991)
- Single and Binary Star Evolution. *Icko Iben, Jr.* 76, 55, 24-G3 (1991)
- Interstellar Grains within Interstellar Grains. *Thomas J. Bernatowicz, Sachiko Amari, Ernst K. Zinner, & Roy S. Lewis.* 373, L73, 97-E10 (1991)
- $^{26}\text{Al}$  and  $^{16}\text{O}$  in the Early Solar System: Clues from Meteoritic  $\text{Al}_2\text{O}_3$ . *Edward Anders, Alois Virág, Ernst Zinner, & Roy S. Lewis.* 373, L77, 97-F6 (1991)
- A Search for the 478 keV Line from the Decay of Nucleosynthetic  $^7\text{Be}$ . *Michael J. Harris, Mark D. Leising, & Gerald H. Share.* 375, 216, 113-F1 (1991)
- Capture Cross Section Measurements of Krypton and Xenon Isotopes and the Fundamental Parameters of the *s*-Process. *Hermann Beer.* 375, 823, 122-G7 (1991)
- Primordial Nucleosynthesis Redux. *Terry P. Walker, Gary Steigman, David N. Schramm, Keith A. Olive, & Ho-Shik Kang.* 376, 51, 125-F1 (1991)
- Inhomogeneous Halo Collapse and Early Galactic Chemical Evolution: Globular Cluster Metallicities. *G. Maliné, D. H. Hartmann, & G. J. Mathews.* 376, 520, 132-G9 (1991)
- Isotopically Anomalous Ti in Presolar SiC from the Murchison Meteorite. *Trevor R. Ireland, Ernst K. Zinner, & Sachiko Amari.* 376, L53, 137-D7 (1991)
- Our Sun. II. Early Mass Loss of  $0.1 M_{\odot}$  and the Case of the Missing Lithium. *Arnold I. Boothroyd, I. Juliana Sackmann, & William A. Fowler.* 377, 318, 141-G11 (1991)
- Lithium Abundances in Carbon Stars. *Grant R. Denn, R. Earle Luck, & David L. Lambert.* 377, 657, 147-G5 (1991)
- Abundance Gradients and Galaxy Formation. *M. Stiavelli & F. Matteucci.* 377, L79, 150-C9 (1991)
- Primordial Nucleosynthesis without a Computer. *Rahim Esmailzadeh, Glenn D. Starkman, & Savas Dimopoulos.* 378, 504, 158-F7 (1991)
- An Analytical Formulation of the Double-Pulse *s*-Process Model. *Hermann Beer.* 379, 409, 168-B1 (1991)
- A Measurement of the  $^{22}\text{Ne}(n, \gamma)^{23}\text{Ne}$  Capture Cross Section at a Stellar Temperature of  $kT = 25$  keV. *Hermann Beer, G. Rupp, F. Voss, & F. Käppeler.* 379, 420, 168-C1 (1991)
- On the Sodium Excess in the Atmospheres of Yellow Supergiants. *N. Prantzos, A. Coc, & J. P. Thibaud.* 379, 729, 173-G1 (1991)
- On the Distribution of the Diffuse Galactic Gamma-Ray Line Emissions at 1809 keV and 511 keV. *P. von Ballmoos.* 380, 98, 177-C1 (1991)
- High-Mass Stars with Degenerate Neutron Cores. *Garrett T. Biehn.* 380, 167, 178-B9 (1991)
- The Galactic Globular Cluster System: Theoretical Constraints for  $\alpha$ -enhanced Compositions. *D. Bercovenni, F. Caputo, M. Manteiga, & M. L. Quarta.* 380, 484, 184-C1 (1991)
- Abundances of Tc and Related Elements in Stars of Type M, MS, and S. *Andrew D. Vanture, George Wallerstein, Jeffery A. Brown, & Grant Bazar.* 381, 278, 192-D7 (1991)
- Capture Rate of the  $^7\text{Li}(n, \gamma)^8\text{Li}$  Reaction by Prompt Gamma-Ray Detection. *Y. Nagai, M. Igashira, N. Mukai, T. Ohsaki, F. Uesawa, K. Takeda, T. Ando, H. Kitazawa, S. Kubono, & T. Fukuda.* 381, 444, 196-C1 (1991)
- s*-Process Ba, Nd, and Sm in Presolar SiC from the Murchison Meteorite. *Ernst Zinner, Sachiko Amari, & Roy S. Lewis.* 382, L47, 205-E11 (1991)
- Nonthermal Excitation of Helium in Type Ib Supernovae. *L. B. Lucy.* 383, 308, 216-A8 (1991)
- NUMERICAL METHODS**
- Galaxy Velocity Dispersions Using a Cross-Correlation Method. *Cristina Dalle Ore, S. M. Faber, J. Jesús Gonzalez, Roland Stoughton, & David Burstein.* 366, 38, 1-E5 (1991)
- N*-Body Simulation of Large-Scale Structures in  $\Lambda \neq 0$  Friedmann Models. *Hugo Martel.* 366, 353, 7-C1 (1991)
- Abel Integral Equation Inversion and Deconvolution by Multi-Gaussian Approximation. *O. Bendinelli.* 366, 599, 10-D11 (1991)
- Statistical Procedure and the Significance of Periodicities in Double-Galaxy Redshifts. *W. J. Cocke & W. G. Tifft.* 368, 383, 29-G6 (1991)
- Light-Curve Inversion Formalism. *Walter J. Wild.* 368, 622, 32-G9 (1991)
- Mesh-refined P<sup>3</sup>M: A Fast Adaptive *N*-Body Algorithm. *H. M. P. Couchman.* 368, L23, 35-A11 (1991)
- Application of the Ewald Method to Cosmological *N*-Body Simulations. *Lars Hernquist, François R. Bouchet, & Yasushi Suto.* 75, 231, 4-B1 (1991)
- Models of White Dwarfs under Rapid Uniform or Differential Rotation: Numerical Results. II. *V. S. Geroyannis & A. A. Hadjopoulos.* 75, 499, 7-D11 (1991)
- Optimal Order and Time-Step Criterion for Aarseth-Type *N*-Body Integrators. *Junichiro Makino.* 369, 200, 38-D7 (1991)
- Numerical Simulations of a Restarting Jet. *David A. Clarke & Jack O. Burns.* 369, 308, 41-E4 (1991)
- The Imaging Performance of the *Hubble Space Telescope*. *Christopher J. Burrows, Jon A. Holtzman, S. M. Faber, Pierre Y. Bely, Hashima Hasan, C. R. Lynds, & Daniel Schroeder.* 369, L21, 45-C1 (1991)
- Redshift-Space Correlation Functions in the Cold Dark Matter Scenario. *Yasushi Suto & Taisushi Sugihara.* 370, L15, 53-C7 (1991)

- Cosmological *N*-Body Simulations with a Tree Code: Fluctuations in the Linear and Nonlinear Regimes. *Tatsushi Suginohara, Yasushi Suto, François R. Bouchet, & Lars Hernquist*. 75, 631, 10-B1 (1991)
- Gravity in One Dimension: A Correction for Ensemble Averaging. *Charles J. Reidl, Jr., & Bruce N. Miller*. 371, 260, 63-D1 (1991)
- A Redshift Survey of *IRAS* Galaxies. III. Reconstruction of the Velocity and Density Fields in *N*-Body Model Universes. *Marc Davis, Michael A. Strauss, & Amos Yahil*. 372, 394, 80-F7 (1991)
- On the Sensitivity of the *N*-Body Problem to Small Changes in Initial Conditions. *Henry E. Kandrup & Haywood Smith, Jr.* 374, 255, 101-C9 (1991)
- Determination of Confidence Limits for Experiments with Low Numbers of Counts. *Ralph P. Kraft, David N. Burrows, & John A. Nousek*. 374, 344, 102-D1 (1991)
- Fourier Spectra of Three-dimensional Data. *David J. Baumgart & J. N. Fry*. 375, 25, 111-C11 (1991)
- Linear and Circular Digital Spectral Analysis of Serial Data. *Richard B. Stothers*. 375, 423, 116-B6 (1991)
- Shot Model Parameters for Cygnus X-1 through Phase Portrait Fitting. *James C. Lochner, J. H. Swank, & A. E. Szmarkowiak*. 376, 295, 128-E9 (1991)
- On the Evaluation of the Fermi-Dirac Integrals. *Robin P. Sagas*. 376, 364, 129-D8 (1991)
- The Fragmentation of "Pancakes" in a Dark Matter-dominated Universe. *Wenbo Yuan, Joan M. Centrella, & Michael L. Norman*. 376, L29, 137-A11 (1991)
- The Evolution of Void-filled Cosmological Structures. *Enikő Regős & Margaret J. Geller*. 377, 14, 138-C1 (1991)
- A Quantitative Measure of Phase Correlations in Density Fields. *Robert J. Scherrer, Adrian L. Melott, & Sergei F. Shandarin*. 377, 29, 138-D5 (1991)
- First Results from the Goddard High-Resolution Spectrograph: A Demonstration of Spectral Resolution and Experiments with Deconvolution. *Glenn M. Wahlgren, David S. Leckrone, Steven N. Shore, Don J. Lindler, Ronald L. Gilliland, & Dennis C. Ebbets*. 377, L41, 143-E6 (1991)
- Dissipational Galaxy Formation. I. Effects of Gasdynamics. *Neal Katz & James E. Gunn*. 377, 365, 144-D1 (1991)
- Fragmentation of Elongated Cylindrical Clouds. III. Formation of Binary and Multiple Systems. *Ian Bonnell, Hugo Martel, Pierre Bastien, Jean-Pierre Arcoragi, & Willy Benz*. 377, 553, 146-E5 (1991)
- Fragmentation of Elongated Cylindrical Clouds. I. Isothermal Clouds. *Pierre Bastien, Jean-Pierre Arcoragi, Willy Benz, Ian Bonnell, & Hugo Martel*. 378, 255, 154-B5 (1991)
- The Structure of Cold Dark Matter Halos. *John Dubinski & R. G. Carlberg*. 378, 496, 158-E11 (1991)
- Searches for Millisecond Pulsations in Low-Mass X-Ray Binaries. *K. S. Wood, J. P. Norris, P. Hertz, B. A. Vaughan, P. F. Michelson, K. Mitsuda, W. H. G. Lewin, J. van Paradijs, W. Penninx, & M. van der Klis*. 379, 295, 166-F9 (1991)
- Application of the Continuous Orthonormalization and Adjoint Methods to the Computation of Solar Eigenfrequencies and Eigenfrequency Sensitivities. *R. D. Rosenwald & G. F. Rabaey*. 77, 97, 44-G1 (1991)
- Excursion Set Mass Functions for Hierarchical Gaussian Fluctuations. *J. R. Bond, S. Cole, G. Efstathiou, & N. Kaiser*. 379, 440, 170-C1 (1991)
- Fragmentation of Elongated Cylindrical Clouds. II. Polytropic Clouds. *Jean-Pierre Arcoragi, Ian Bonnell, Hugo Martel, Willy Benz, & Pierre Bastien*. 380, 476, 184-B7 (1991)
- Three-dimensional Compressible Hydrodynamic Convection in the Sun and Stars. *Murshed Hossain & D. J. Mullan*. 380, 631, 186-A10 (1991)
- On Equation of State Interpolation Errors in Stellar Interior Calculations. *Ben Dorman, Alan W. Irwin, & Brian B. Pedersen*. 381, 228, 191-G4 (1991)
- Integral and Differential Cross Sections for Electron Impact Ionization. *R. E. H. Clark, J. Abdallah, Jr., & J. B. Mann*. 381, 597, 198-B9 (1991)
- Precollapse Scale Invariance in Gravitational Instability. *F. Moutarde, J.-M. Alimi, F. R. Bouchet, R. Pellat, & A. Ramani*. 382, 377, 206-C5 (1991)
- Influence of a Dark Halo on the Stability of Elliptical Galaxies. *M. Stiavelli & L. S. Sparke*. 382, 466, 207-D1 (1991)
- Simultaneous Correlation Analysis of Combined Gamma-Ray Data. *K. N. Yu*. 382, 647, 209-F1 (1991)
- The Three-Point Correlation Function for Abell Clusters: Observations and Simulations. *J. Richard Gott III, Bin Gao, & Changbom Park*. 383, 90, 213-B10 (1991)
- OCCULTATIONS**
- Stellar Occultation of Polarized Light from Circumstellar Electrons. II. Flat Envelopes Viewed at Arbitrary Inclination. *Geoffrey K. Fox & John C. Brown*. 375, 300, 114-F1 (1991)
- Stellar Occultation of Polarized Light from Circumstellar Electrons. III. General Axisymmetric Envelopes. *Geoffrey K. Fox*. 379, 663, 173-A1 (1991)
- OPACITIES**
- Mixing Length and Opacity Effects: Deep Convective Envelopes on the Asymptotic Giant Branch. *L-Juliana Sackmann & Arnold I. Boothroyd*. 366, 529, 9-E7 (1991)
- Opacities for the Solar Radiative Interior. *C. A. Iglesias & F. J. Rogers*. 371, 408, 65-C1 (1991)
- Opacity Tables for Cepheid Variables. *Carlos A. Iglesias & Forrest J. Rogers*. 371, L73, 73-D1 (1991)
- Ionization by High-Energy Particles and the Electron Scattering Opacity in Supernovae. *Douglas A. Swartz*. 373, 604, 95-D11 (1991)
- Rosseland and Planck Mean Opacities of a Zero-Metallicity Gas. *Paolo Lenzini, David F. Chernoff, & Edwin E. Salpeter*. 76, 759, 35-B13 (1991)
- Lyman-Alpha Depression of the Continuum from High-Redshift Quasars: A New Technique Applied in Search of the Gunn-Peterson Effect. *Edward B. Jenkins & Jeremiah P. Ostriker*. 376, 33, 125-D9 (1991)
- Continuum Opacity Produced by Spectral Lines in Supernovae and Similar Explosions. *Robert V. Wagoner, Christopher A. Perez, & Mary Vasu*. 377, 639, 147-E12 (1991)
- The Effect of the Mihalas, Hummer, and Däppen Equation of State and the Molecular Opacity on the Standard Solar Model. *Y.-C. Kim, P. Demarque, & D. B. Guenther*. 378, 407, 156-A10 (1991)
- Galactic Bulge M Giants. IV. 0.5–2.5 Micron Spectrophotometry and Abundances for Stars in Baade's Window. *D. M. Terndrup, Jay A. Frogel, & A. E. Whitford*. 378, 742, 161-E5 (1991)
- Effects of Opacity and Equation of State on Solar Structure and Oscillations. *Joyce A. Guzik & Arthur N. Cox*. 381, 333, 193-B5 (1991)
- Metal Opacities and Convective Core Overshooting in Population I Stars. *Richard B. Stothers & Chao-wen Chin*. 381, L67, 199-E7 (1991)
- Masses of RRab Variables Using Livermore OPAL Opacities. *Arthur N. Cox*. 381, L71, 199-F1 (1991)
- The Rosseland Mean Free-Free Gaunt Factor of the Dense High-Temperature Stellar Plasma. *Naoki Itoh, Fumiyoji Kuwashima, Koki Ichihashi, & Haruhiko Mutoh*. 382, 636, 209-E1 (1991)
- PARTICLE ACCELERATION**
- Oblique Mixed Shocks in Extragalactic Jets. *D. Fraix-Burnet & G. Pelletier*. 367, 86, 13-B1 (1991)
- Heliospheric Effects on Cosmic-Ray Electrons. *H. Moraal, J. R. Jokipii, & R. A. Mewaldt*. 367, 191, 14-D8 (1991)
- Universal Particle Acceleration. *J. I. Katz*. 367, 407, 18-E1 (1991)
- On the Transport and Acceleration of Solar Flare Particles in a Coronal Loop. *James M. Ryan & Martin A. Lee*. 368, 316, 26-A7 (1991)
- Problems of Ultra-High-Energy Particle Acceleration in Cygnus X-3: A Critical Reappraisal. *Abhas Mitra*. 370, 345, 51-E7 (1991)
- Viscosity and Inertia in Cosmic-Ray Transport: Effects of an Average Magnetic Field. *L. L. Williams & J. R. Jokipii*. 371, 639, 69-E3 (1991)
- Relativistic Electron Populations in Cassiopeia A. *M. Anderson, L. Rudnick, P. Leppik, R. Perley, & R. Braun*. 373, 146, 87-G4 (1991)
- Transverse Conductivity of a Relativistic Plasma in Oblique Electric and Magnetic Fields. *Fulvio Melia & Marco Fatuzzo*. 373, 198, 88-D8 (1991)

- A Slingshot Model for Solar Flares. *Gregory Benford*. 373, 671, 96-C9 (1991)
- Cosmic-Ray Distribution and the Dynamic Balance in the Large Magellanic Cloud. *Carl E. Fichel, Mehmet E. Özel, Robert G. Stone, & P. Sreekumar*. 374, 134, 99-F7 (1991)
- Consequences of Strong Pitch-Angle Diffusion of Particles in Solar Flares. *P. A. Bespalov, V. V. Zaitsev, & A. V. Stepanov*. 374, 369, 102-F5 (1991)
- Energy Degradation of Fast Electrons in Hydrogen Gas. *Yueming Xu & Richard McCray*. 375, 190, 113-D1 (1991)
- Interrelation of Soft and Hard X-Ray Emissions during Solar Flares. I. Observations. *R. M. Winglee, A. L. Kiplinger, D. M. Zarro, G. A. Dulk, & J. R. Lemen*. 375, 366, 115-D13 (1991)
- Interrelation of Soft and Hard X-Ray Emissions during Solar Flares. II. Simulation Model. *R. M. Winglee, G. A. Dulk, P. L. Bornmann, & J. C. Brown*. 375, 382, 115-F1 (1991)
- Magnetohydrodynamic Turbulence Dissipation and Stochastic Proton Acceleration in Solar Flares. *James A. Miller*. 376, 342, 129-B11 (1991)
- Transient Particle Acceleration in Strongly Magnetized Neutron Stars. *Fulvio Melia & Marco Fatuzzo*. 376, 673, 134-F7 (1991)
- The Interaction of Collisionless Shocks in Astrophysical Plasmas. *P. J. Cargill*. 376, 771, 136-A1 (1991)
- Particle Injection following Solar Flares on 1980 May 28 and June 8: Evidence for Different Injection Time Histories in Impulsive and Gradual Events? *M.-B. Kallenrode & G. Wibberenz*. 376, 787, 136-B8 (1991)
- Cosmic-Ray Transport and Gamma-Ray Emission in Supernova Shells. *A. K. Harding, A. Mastichiadis, R. J. Protheroe, & A. P. Szabo*. 378, 163, 153-A9 (1991)
- A Mechanism for Gamma-Ray Bursts by Alfvén-Wave Acceleration in a Nonuniform Atmosphere. *K. A. Holcomb & T. Tajima*. 378, 682, 160-G10 (1991)
- Measurement of Cosmic-Ray Proton and Helium Spectra during the 1987 Solar Minimum. *E. S. Seo, J. F. Ormes, R. E. Streitmatter, S. J. Stochaj, W. V. Jones, S. A. Stephens, & T. Bowen*. 378, 763, 161-G1 (1991)
- Center-to-Limb Variations of Characteristics of Solar Flare Hard X-Ray and Gamma-Ray Emission. *James M. McTiernan & Václav Petrosian*. 379, 381, 167-F11 (1991)
- A Measurement of the Cosmic-Ray  $^2\text{H}$  and  $^3\text{He}$  Spectra and  $^2\text{H}/^4\text{He}$  and  $^3\text{He}/^4\text{He}$  Ratios in 1989. *W. R. Webber, R. L. Golden, S. J. Stochaj, J. F. Ormes, & R. E. Streitmatter*. 380, 230, 178-G9 (1991)
- Subthreshold Stochastic Diffusion with Application to Selective Acceleration of  $^3\text{He}$  in Solar Flares. *Spiliotis Riyopoulos*. 381, 578, 197-G5 (1991)
- Inverse-Compton Gamma-Ray Emission from Chaotic, Early-Type Stellar Winds and Its Detectability by *Gamma Ray Observatory*. *Wan Chen & Richard L. White*. 381, L63, 199-E1 (1991)
- Electron Acceleration in a Nonlinear Shock Model with Applications to Supernova Remnants. *Donald C. Ellison & Stephen P. Reynolds*. 382, 242, 203-C1 (1991)
- Outflows Driven by Cosmic-Ray Pressure in Broad Absorption Line QSOs. *Mitchell C. Begelman, Martijn de Kool, & Marek Sikora*. 382, 416, 206-F9 (1991)
- Transient Particle Acceleration in Strongly Magnetized Neutron Stars. II. Effects Due to a Dipole Field Geometry. *Marco Fatuzzo & Fulvio Melia*. 382, 570, 208-E10 (1991)
- Magnetized Supernova Remnants with Cosmic Rays. *Katia M. Ferrière & Ellen G. Zweibel*. 383, 602, 221-F11 (1991)
- Formation of Dense Charged Bunches in Vacuum Gaps. *F. Curtis Michel*. 383, 808, 224-C6 (1991)
- Gamma-Ray Bursts from Sheared Alfvén Waves. *Fulvio Melia & Marco Fatuzzo*. 383, L57, 226-D1 (1991)
- ### PHOTOMETRY
- ESO 207-61: A Brown Dwarf Candidate in the Hyades Moving Group. *Maria Teresa Ruiz, Marianne Y. Takamiya, & Miguel Roth*. 367, L59, 22-C7 (1991)
- The Brightness, Albedo, and Temporal Variability of Neptune. *G. W. Lockwood, D. T. Thompson, B. L. Lutz, & E. S. Howell*. 368, 287, 26-F1 (1991)
- Light-Curve Inversion Formalism. *Walter J. Wild*. 368, 622, 32-G9 (1991)
- ### The Imaging Performance of the Hubble Space Telescope
- Christopher J. Burrows, Jon A. Holtzman, S. M. Faber, Pierre Y. Bely, Hashima Hasan, C. R. Lynds, & Daniel Schroeder*. 369, L21, 45-C1 (1991)
- ### Stellar Photometry with the Hubble Space Telescope Wide-Field/Planetary Camera: A Progress Report
- Jon A. Holtzman, Edward J. Groth, Robert M. Light, S. M. Faber, Deidre Hunter, Earl J. O'Neil, Jr., Edward J. Shaya, William A. Baum, Bel Campbell, Arthur Code, Douglas G. Currie, S. P. Ewald, J. Jeff Hester, T. Kelsall, Tod R. Lauer, Roger Lynds, Donald P. Schneider, P. Kenneth Seidelmann, & James A. Westphal*. 369, L35, 45-E1 (1991)
- ### Bok Globules and Small Molecular Clouds: Deep IRAS Photometry and $^{12}\text{CO}$ Spectroscopy
- Dan P. Clemens, João Lin Yun, & Mark H. Heyer*. 75, 877, 13-E1 (1991)
- ### Multicolor CCD Photometry of Globular Clusters in Two Virgo Elliptical Galaxies
- Jean Couture, William E. Harris, & J. W. B. Albright*. 372, 97, 75-C1 (1991)
- ### Rapid Ultraviolet Variability in the BL Lacertae Object PKS 2155–304
- R. A. Edelson, J. Saken, G. Pike, C. M. Urry, I. M. George, R. S. Warwick, H. R. Miller, M. T. Carini, & J. R. Webb*. 372, L9, 79-B5 (1991)
- ### The Extraordinary 1989 December 14/15 Optical Flare Events on V711 Tauri
- Gregory W. Henry & Douglas S. Hall*. 373, L9, 91-B7 (1991)
- ### The Structure and Evolution of Rich Star Clusters in the Large Magellanic Cloud
- Rebecca A. W. Elson*. 76, 185, 26-E9 (1991)
- ### Diameters of Galactic Globular Clusters
- Sidney van den Bergh, Christopher Morley, & John Pazder*. 375, 594, 120-B1 (1991)
- ### Photoelectric UVB Photometry of Stars Selected in the HK Objective Prism Survey
- George W. Preston, Stephen A. Shectman, & Timothy C. Beers*. 76, 1001, 38-G5 (1991)
- ### UBV Photometry of OB<sup>+</sup> Stars in the Southern Milky Way
- J. S. Drilling*. 76, 1033, 39-C11 (1991)
- ### UBVRI Photometry of Stars in the Fields of X-Ray Selected BL Lacertae Objects
- Paul S. Smith, Buell T. Jannuzzi, & Richard Elston*. 77, 67, 44-D1 (1991)
- ### Infrared Images, Virgo Spirals, and the Tully-Fisher Law
- R. F. Peletier & S. P. Willner*. 382, 382, 206-C13 (1991)
- ### Optical Polarimetry of PKS 2155–304 and Constraints on Accretion Disk Models for BL Lacertae Objects
- Paul S. Smith & Michael L. Sitko*. 383, 580, 221-D9 (1991)
- ### PLANETS: ABUNDANCES
- #### Detection of $^{13}\text{C}$ -Ethane in Jupiter's Atmosphere
- Günter Wiedemann, Gordon L. Björaker, & Donald E. Jennings*. 383, L29, 219-D7 (1991)
- ### PLANETS: ATMOSPHERES
- #### What Maintains the Zonal Circulation in Planetary Atmospheres?
- H. G. Mayr, K. L. Chan, I. Harris, & K. Schatten*. 367, 361, 16-E1 (1991)
- #### Atomic Oxygen Fine-Structure Splittings with Tunable Far-Infrared Spectroscopy
- Lyndon R. Zink, Kenneth M. Evenson, Fusakazu Matsushima, Thomas Nelis, & Ruth L. Robinson*. 371, L85, 73-E3 (1991)
- #### First Absolute Wind Measurements in the Middle Atmosphere of Mars
- Emmanuel Lellouch, Jeffrey J. Goldstein, Stephen W. Bougher, Gabriel Paubert, & Jan Rosengqvist*. 383, 401, 217-C5 (1991)
- #### Detection of $^{13}\text{C}$ -Ethane in Jupiter's Atmosphere
- Günter Wiedemann, Gordon L. Björaker, & Donald E. Jennings*. 383, L29, 219-D7 (1991)
- ### PLANETS: CHARGED PARTICLES
- #### Determination of Ionic Abundances in the Io Torus Using the Hopkins Ultraviolet Telescope
- H. W. Moos, P. D. Feldman, S. T. Durrance, W. P. Blair, C. W. Bowers, A. E. Davidsen, W. V. Dixon, H. C. Ferguson, R. C. Henry, R. A. Kimble, G. A. Kriss, J. W. Kruk, K. S. Long, & O. Vancura*. 382, L105, 211-F3 (1991)
- ### PLANETS: FORMATION
- #### The Dynamical Evolution of the Protosolar Nebula
- Steven P. Ruden & James B. Pollack*. 375, 740, 121-G11 (1991)

- Dynamo Magnetic Field Modes in Thin Astrophysical Disks: An Adiabatic Computational Approximation.** *T. E. Stepinski & E. H. Levy.* 379, 343, 167-C9 (1991)
- The Origin of the Planet around PSR 1829-10.** *Takashi Nakamura & Tsvi Piran.* 382, L81, 211-C13 (1991)
- Gravitational Instabilities in a Proto-Planetary Disk.** *Hyerim Noh, Ethan T. Vishniac, & William D. Cochran.* 383, 372, 217-A1 (1991)
- PLANETS: GENERAL**
- Gravitational Microlensing by Double Stars and Planetary Systems.** *Shude Mao & Bohdan Paczyński.* 374, L37, 110-B11 (1991)
- A Model for Tidally Driven Eccentric Instabilities in Fluid Disks.** *Stephen H. Lubow.* 381, 259, 192-B12 (1991)
- PLANETS: INTERIORS**
- Cold Nuclear Fusion in Dense Metallic Hydrogen.** *Charles J. Horowitz.* 367, 288, 15-E13 (1991)
- What Maintains the Zonal Circulation in Planetary Atmospheres?** *H. G. Mayr, K. L. Chan, I. Harris, & K. Schatten.* 367, 361, 16-E1 (1991)
- PLANETS: JUPITER**
- What Maintains the Zonal Circulation in Planetary Atmospheres?** *H. G. Mayr, K. L. Chan, I. Harris, & K. Schatten.* 367, 361, 16-E1 (1991)
- The Structure of Io's Corona.** *N. M. Schneider, D. M. Hunten, W. K. Wells, A. B. Schultz, & U. Fink.* 368, 298, 27-G1 (1991)
- The Cyclotron Maser Instability: Application to Low-Density Magnetoplasmas.** *H. P. Ladreiter.* 370, 419, 52-D12 (1991)
- Dielectronic Recombination Rate Coefficients for S<sup>q+</sup> ( $q = 1-5$ ) Ions.** *N. R. Badnell.* 379, 356, 167-D9 (1991)
- Detection of <sup>13</sup>C-Ethane in Jupiter's Atmosphere.** *Günter Wiedemann, Gordon L. Björaker, & Donald E. Jennings.* 383, L29, 219-D7 (1991)
- PLANETS: MAGNETOSPHERES**
- The Cyclotron Maser Instability: Application to Low-Density Magnetoplasmas.** *H. P. Ladreiter.* 370, 419, 52-D12 (1991)
- Determination of Ionic Abundances in the Io Torus Using the Hopkins Ultraviolet Telescope.** *H. W. Moos, P. D. Feldman, S. T. Durrance, W. P. Blair, C. W. Bowers, A. F. Davidsen, W. V. Dixon, H. C. Ferguson, R. C. Henry, R. A. Kimble, G. A. Kriss, J. W. Kruk, K. S. Long, & O. Vancura.* 382, L105, 211-F3 (1991)
- PLANETS: MARS**
- First Absolute Wind Measurements in the Middle Atmosphere of Mars.** *Emmanuel Lellouch, Jeffrey J. Goldstein, Stephen W. Bougher, Gabriel Paubert, & Jan Rosengqvist.* 383, 401, 217-C5 (1991)
- PLANETS: NEPTUNE**
- What Maintains the Zonal Circulation in Planetary Atmospheres?** *H. G. Mayr, K. L. Chan, I. Harris, & K. Schatten.* 367, 361, 16-E1 (1991)
- The Brightness, Albedo, and Temporal Variability of Neptune.** *G. W. Lockwood, D. T. Thompson, B. L. Lutz, & E. S. Howell.* 368, 287, 26-F1 (1991)
- PLANETS: PLUTO**
- Light-Curve Inversion Formalism.** *Walter J. Wild.* 368, 622, 32-G9 (1991)
- First Results from the Faint Object Camera: High-Resolution Imaging of the Pluto-Charon System.** *R. Albrecht, C. Barbieri, J. C. Blades, A. Boksenberg, P. Crane, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kamperman, J. R. King, F. Macchetto, C. D. Mackay, F. Paresce, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, & W. B. Sparks.* 374, L65, 110-E5 (1991)
- PLANETS: SATELLITES**
- The Structure of Io's Corona.** *N. M. Schneider, D. M. Hunten, W. K. Wells, A. B. Schultz, & U. Fink.* 368, 298, 27-G1 (1991)
- Dielectronic Recombination Rate Coefficients for S<sup>q+</sup> ( $q = 1-5$ ) Ions.** *N. R. Badnell.* 379, 356, 167-D9 (1991)
- Determination of Ionic Abundances in the Io Torus Using the Hopkins Ultraviolet Telescope.** *H. W. Moos, P. D. Feldman, S. T. Durrance, W. P. Blair, C. W. Bowers, A. F. Davidsen, W. V. Dixon, H. C. Ferguson, R. C. Henry, R. A. Kimble, G. A. Kriss, J. W. Kruk, K. S. Long, & O. Vancura.* 382, L105, 211-F3 (1991)
- Non-LTE Models of Titan's Upper Atmosphere.** *Roger V. Yelle.* 383, 380, 217-A10 (1991)

**PLANETS: SATURN**

- On the Radial Structure of Saturn's B Ring.** *Lin-Hua Shan & C. K. Goertz.* 367, 350, 16-D1 (1991)
- Hubble Space Telescope Wide-Field/Planetary Camera Images of Saturn.** *James A. Westphal, William A. Baum, Tod R. Lauer, G. Edward Danielson, Douglas G. Currie, S. P. Ewald, S. M. Faber, Edward J. Groth, J. Jeff Hester, Robert M. Light, Roger Lynds, Earl J. O'Neil, Jr., P. Kenneth Seidelmann, Edward J. Shaya, & Bradford A. Smith.* 369, L51, 45-G1 (1991)

**The Cyclotron Maser Instability: Application to Low-Density Magnetoplasmas.** *H. P. Ladreiter.* 370, 419, 52-D12 (1991)

**Non-LTE Models of Titan's Upper Atmosphere.** *Roger V. Yelle.* 383, 380, 217-A10 (1991)

**PLANETS: SPECTRA**

- The Brightness, Albedo, and Temporal Variability of Neptune.** *G. W. Lockwood, D. T. Thompson, B. L. Lutz, & E. S. Howell.* 368, 287, 26-F1 (1991)

**Discovery of a Doppler-limited CO Line in the Upper Mesosphere of Venus: A New Dynamical Probe.** *David Buhl, Gordon Chin, & Jeffrey J. Goldstein.* 369, L17, 40-C1 (1991)

**Detection of <sup>13</sup>C-Ethane in Jupiter's Atmosphere.** *Günter Wiedemann, Gordon L. Björaker, & Donald E. Jennings.* 383, L29, 219-D7 (1991)

**PLANETS: VENUS**

- What Maintains the Zonal Circulation in Planetary Atmospheres?** *H. G. Mayr, K. L. Chan, I. Harris, & K. Schatten.* 367, 361, 16-E1 (1991)

**Discovery of a Doppler-limited CO Line in the Upper Mesosphere of Venus: A New Dynamical Probe.** *David Buhl, Gordon Chin, & Jeffrey J. Goldstein.* 369, L17, 40-C1 (1991)

**PLASMAS**

- Three-dimensional Kinematic Reconnection of Plasmoids.** *Yun-Tung Lau & John M. Finn.* 366, 577, 10-B11 (1991)

**Saturation of the Synchrotron Megamaser.** *André R. Crusius-Wätzl.* 368, 390, 30-A1 (1991)

**Formulas for the Cyclotron Luminosity of Magnetized Plasma Slabs.** *G. Chamugam & Steven H. Langer.* 368, 580, 32-C11 (1991)

**Luminosity Enhancement Factor for Thermal Comptonization and the Electron Energy Balance.** *C. D. Dermer, E. P. Liang & E. Canfield.* 369, 410, 42-G5 (1991)

**The Finite-Amplitude Behavior of the Joule Mode under Astrophysical Conditions.** *G. Bodo, S. Massaglia, R. Rosner, & A. Ferrari.* 370, 398, 52-C1 (1991)

**The Cyclotron Maser Instability: Application to Low-Density Magnetoplasmas.** *H. P. Ladreiter.* 370, 419, 52-D12 (1991)

**Mechanisms for Pulsar Eclipse.** *David Eichler.* 370, L27, 53-D11 (1991)

**On the Thermal Stability of Slabs, Cylinders, and Spheres.** *Miguel H. Ibáñez S., & Florencio P. Plachco M.* 370, 743, 57-F1 (1991)

**Ambipolar Diffusion, Cloud Cores, and Star Formation: Two-dimensional, Cylindrically Symmetric Contraction. I. The Issues, Formulation of the Problem, and Method of Solution.** *Telemachos Ch. Mouschovias & Scott A. Morton.* 371, 296, 63-G1 (1991)

**Densities and Abundances of Hot Cometary Ions in the Coma of P/Halley.** *M. Neugebauer, R. Goldstein, B. E. Goldstein, S. A. Fuselier, H. Balsiger, & W.-H. Ip.* 372, 291, 77-E6 (1991)

**Solar and Stellar Radio Spikes: Limits on the Saturation of the Electron-Cyclotron Maser.** *Donat G. Wentzel & Markus J. Aschwanden.* 372, 688, 84-C1 (1991)

**Magnetic Braking, Ambipolar Diffusion, Cloud Cores, and Star Formation: Natural Length Scales and Protostellar Masses.** *Telemachos Ch. Mouschovias.* 373, 169, 88-B3 (1991)

**Direct Radiation from a Strong DC Electric Field.** *Donat G. Wentzel.* 373, 285, 89-E3 (1991)

**Accurate Collision Integrals for the Attractive Static Screened Coulomb Potential with Application to Electrical Conductivity.** *James MacDonald.* 76, 369, 29-F3 (1991)

**Roseland and Planck Mean Opacities of a Zero-Metallicity Gas.** *Paolo Lanzani, David F. Chernoff, & Edwin E. Salpeter.* 76, 759, 35-B13 (1991)

- Siphon Flows in Isolated Magnetic Flux Tubes. IV. Critical Flows with Standing Tube Shocks. *John H. Thomas & Benjamin Montesinos*. 375, 404, 115-G11 (1991)
- The Dissipation of Magnetohydrodynamic Turbulence Responsible for Interstellar Scintillation and the Heating of the Interstellar Medium. *Steven R. Spangler*. 376, 540, 133-B5 (1991)
- The Interaction of Collisionless Shocks in Astrophysical Plasmas. *P. J. Cargill*. 376, 771, 136-A1 (1991)
- Asymptotic Structure of Hydromagnetically Driven Relativistic Winds. *Tzihong Chiueh, Zhi-yun Li, & Mitchell C. Begelman*. 377, 462, 145-D11 (1991)
- The O VII Soft X-Ray Spectrum and Its Application to Hot Plasmas in Astrophysics. *A. H. Gabriel, F. Bely-Dubau, P. Faucher, & L. W. Acton*. 378, 438, 156-D1 (1991)
- Coherent Radiation from Energetic Electron Streams via Collisionless Bremsstrahlung in Strong Plasma Turbulence. *James C. Weatherall & Gregory Benford*. 378, 543, 159-B8 (1991)
- Joule Heating as an Explanation for the Differential Emission Measure Structure and Systematic Redshifts in the Sun's Lower Transition Region. *George Roumeliotis*. 379, 392, 167-G9 (1991)
- Propagation of Magnetoacoustic Waves in the Solar Atmosphere with Random Inhomogeneities of Density and Magnetic Fields. *M. Ryutova, M. Kaisig, & T. Tajima*. 380, 268, 179-D1 (1991)
- Magnetic Field-aligned Electric Potentials in Nonideal Plasma Flows. *K. Schindler, M. Hesse, & J. Birn*. 380, 293, 179-G9 (1991)
- Collisional Rates and Cooling within Atomic Hydrogen Plasmas. *T. T. Scholz & H. R. J. Walters*. 380, 302, 180-A5 (1991)
- Avalanches and the Distribution of Solar Flares. *Edward T. Lu & Russell J. Hamilton*. 380, L89, 188-F5 (1991)
- Magnetoacoustic Heating of the Solar Chromosphere. *Joseph M. Davila & S. M. Chitre*. 381, L31, 194-D12 (1991)
- The Rosseland Mean Free-Free Gaunt Factor of the Dense High-Temperature Stellar Plasma. *Naoki Itoh, Fumiyoji Kuwashima, Koki Ichihashi, & Haruhiko Mutoh*. 382, 636, 209-E1 (1991)
- Coronal Evolution Due to Shear Motion. *R. S. Steinolfson*. 382, 677, 210-A13 (1991)
- POLARIZATION**
- Detection of Polarized Ultraviolet Emission from the High-Redshift Radio Galaxy 3C 265. *Buell T. Jannuzzi & Richard Elston*. 366, L69, 11-CS (1991)
- A Technique for Using Radio Jets as Extended Gravitational Lensing Probes. *Philipp P. Kronberg, Charles C. Dyer, E. Margaret Burbidge, & Vesa T. Junkkarinen*. 367, L1, 17-B1 (1991)
- Extinction and Polarization of Transmitted Light by Partially Aligned Nonspherical Grains. *Mikhail I. Mishchenko*. 367, 561, 20-C8 (1991)
- Faraday Rotation and Physical Conditions in the Crab Nebula. *M. F. Bietenholz & P. P. Kronberg*. 368, 231, 26-A1 (1991)
- Observation of a Pulsar Wind: CCD Polarimetry of the Crab Nebula. *F. C. Michel, P. A. Scowen, R. J. Dufour, & J. J. Hester*. 368, 463, 30-G1 (1991)
- Infrared Polarimetry of Quasars. *Michael L. Siuko & Yudong Zhu*. 369, 106, 37-CS (1991)
- Continuum Polarization by Electron Scattering in Rotationally Distorted, Radiation-driven Stellar Winds: B[e] Supergiants. *Cameron J. Boyd & J. M. Marlborough*. 369, 191, 38-C11 (1991)
- Thomson Scattering in a Magnetic Field. II. Arbitrary Field Orientation. *Barbara A. Whitney*. 369, 451, 43-C10 (1991)
- Circular Polarization in 1612 MHz OH Maser Emission from OH/IR Stars. *Philip J. Zell & John D. Fox*. 369, 506, 44-A9 (1991)
- Polarimetric Mapping of Orion Using MILLIPOL: Magnetic Activity in BN/KL. *Robert W. Leach, Dan P. Clemens, Brian D. Kane, & Richard Barvainis*. 370, 257, 50-D1 (1991)
- Polarization of Astronomical Maser Radiation. *Moshe Elitzur*. 370, 407, 52-C12 (1991)
- Fluctuations in Astronomical Masers. *Moshe Elitzur*. 370, L45, 53-F6 (1991)
- A Relativistic Model of Pulsar Polarization. *M. Blaskiewicz, J. M. Cordes, & I. Wasserman*. 370, 643, 56-D9 (1991)
- Synchrotron Radiation with Radiation Reaction. *Robert W. Nelson & Ira Wasserman*. 371, 265, 63-D7 (1991)
- Multifrequency VLA, VLBI, and Single-Dish Observations of the Quasar 4C 39.25. *Alan P. Marscher, Yun Fei Zhang, David B. Shaffer, Hugh D. Aller, & Margo F. Aller*. 371, 491, 67-E12 (1991)
- Synchronization of the Magnetic Nova V1500 Cygni. *Gary D. Schmidt & H. S. Stockman*. 371, 749, 70-G7 (1991)
- Thomson Scattering in a Magnetic Field. I. Field along z. *Barbara A. Whitney*. 375, 1293, 22-F1 (1991)
- Optical and Near-Infrared Polarimetry of the Infrared Luminous Galaxy IRAS 23060+0505. *J. H. Hough, C. Brindle, Beverley J. Wills, D. Wills, & J. Bailey*. 372, 478, 81-F9 (1991)
- On the Dispersion in Direction of Interstellar Polarization. *P. C. Myers & A. A. Goodman*. 373, 509, 94-C9 (1991)
- Broad-Band Linear Polarization in Cool Stars. I. Models and Spatial Effects for Magnetic and Scattering Regions. *Juhani Huovelin & Steven H. Saar*. 374, 319, 102-B1 (1991)
- Optical Polarization of a Complete Sample of Radio Sources. *C. D. Impey, C. R. Lawrence, & S. Tapia*. 375, 46, 111-E10 (1991)
- Scattering-induced Optical Polarization in Thick Accretion Disks. *John F. Krtjie & Ariele Königl*. 375, 69, 111-G6 (1991)
- Analysis of SN 1987A Polarimetry. *David J. Jeffery*. 375, 264, 114-C5 (1991)
- Stellar Occultation of Polarized Light from Circumstellar Electrons. II. Flat Envelopes Viewed at Arbitrary Inclination. *Geoffrey K. Fox & John C. Brown*. 375, 300, 114-F1 (1991)
- Molecular Hydrogen Polarization Images of OMC-1. *Michael G. Burton, N. R. Minchin, J. H. Hough, C. Aspin, D. J. Axon, & J. A. Bailey*. 375, 611, 120-C9 (1991)
- Direct VLBI Detection of the Magnetosphere Surrounding the Young Star SI in  $\rho$  Ophiuchi. *Philippe André, Robert B. Phillips, Jean-François Lestrade, & Karl-Ludwig Klein*. 376, 630, 134-B12 (1991)
- Multidirectional Views of the Active Nucleus of NGC 1068. *J. S. Miller, R. W. Goodrich, & William G. Mathews*. 378, 47, 151-E13 (1991)
- Infrared Polarization Images of Star-forming Regions. I. The Ubiquity of Bipolar Structure. *M. Tamura, Ian Gatley, R. R. Joyce, M. Ueno, H. Suto, & M. Sekiguchi*. 378, 611, 160-A1 (1991)
- Detection of Excess Rotation Measure Due to Intracluster Magnetic Fields in Clusters of Galaxies. *K.-T. Kim, Peter C. Tribble, & P. P. Kronberg*. 379, 80, 164-A5 (1991)
- Stellar Occultation of Polarized Light from Circumstellar Electrons. III. General Axisymmetric Envelopes. *Geoffrey K. Fox*. 379, 663, 173-A1 (1991)
- What Are the Gigahertz Peaked-Spectrum Radio Sources? *C. P. O'Dea, S. A. Baum, & C. Stanghellini*. 380, 66, 176-G5 (1991)
- Polarimetric Imaging of the Galactic Center at 12.4 Microns: The Detailed Magnetic Field Structure in the Northern Arm and East-West Bar. *David K. Aitken, Daniel Gezari, Craig H. Smith, Mark McCaughrean, & Patrick F. Roche*. 380, 419, 183-D10 (1991)
- Depolarization Asymmetry in the Quasar 3C 47. *Ilias Fernini, J. Patrick Leahy, Jack O. Burns, & John P. Basart*. 381, 63, 189-G1 (1991)
- Polarized Radio Emission from the Edge-on Spiral Galaxies NGC 891 and NGC 4565. *S. Sukumar & R. J. Allen*. 382, 100, 201-D1 (1991)
- Polarization Properties of Emission Lines from Relativistic Accretion Disks. *Kaiyou Chen & Douglas M. Eardley*. 382, 125, 201-F10 (1991)
- On the Wind Geometry of the Wolf-Rayet Star EZ Canis Majoris. *R. E. Schulte-Ladbeck, K. H. Nordsieck, M. Taylor, M. A. Nook, K. S. Bjorkman, A. M. Magalhães, & C. M. Anderson*. 382, 201, 204-A1 (1991)
- Catalog of SN 1987A Polarimetry Corrected for Interstellar Polarization. *David J. Jeffery*. 382, 405, 50-B5 (1991)
- Vector Magnetic Fields in Sunspots. I. Stokes Profile Analysis Using the Marshall Space Flight Center Magnetograph. *K. S. Balasubramanian & E. A. West*. 382, 699, 210-C11 (1991)
- First Ultraviolet Spectropolarimetry of Hot Supergiants. *M. Taylor, A. D. Code, K. H. Nordsieck, C. M. Anderson, B. L. Babler, K. S. Bjorkman, G. C. Clayton, A. M. Magalhães, M. R. Meade, R. E. Schulte-Ladbeck, & B. A. Whitney*. 382, L85, 211-D5 (1991)
- Discrete Ordinate Solution of the Radiative Transfer Equation in the "Polarization Normal Wave Representation." *A. Kylling*. 383, 243, 215-C1 (1991)

- Optical Polarimetry of PKS 2155–304 and Constraints on Accretion Disk Models for BL Lacertae Objects.** *Paul S. Smith & Michael L. Sitko.* 383, 580, 221–D9 (1991)
- First Ultraviolet Spectropolarimetry of Be Stars from the Wisconsin Ultraviolet Photo-Polarimeter Experiment.** *K. S. Bjorkman, K. H. Nordsteck, A. D. Code, C. M. Anderson, B. L. Babler, G. C. Clayton, A. M. Magalhães, M. R. Meade, M. A. Nook, R. E. Schulte-Ladbeck, M. Taylor, & B. A. Whitney.* 383, L67, 226–E1 (1991)
- PULSARS**
- Neutron Star Crustal Plate Tectonics. I. Magnetic Dipole Evolution in Millisecond Pulsars and Low-Mass X-Ray Binaries.** *M. Ruderman.* 366, 261, 4–C5 (1991)
- A New X-Ray Pulsar GS 2138+56 (Cepheus X-4).** *Katsuji Koyama, Mitsunobu Kawada, Yuzuru Tawara, Kazuhiro Kimura, Shunji Kitamoto, Sigenori Miyamoto, Hiroshi Tsunemi, Ken Ebisawa, & Fumiaki Nagase.* 366, L19, 6–C5 (1991)
- Birthrates of Galactic Millisecond Pulsars and Their Low-Mass X-Ray Binary Precursors.** *Marco Tavani.* 366, L27, 6–D1 (1991)
- Refractive Interstellar Scintillation and Millisecond Pulsar Timing.** *Wayne Hu, Roger W. Romani, & Daniel R. Stinebring.* 366, L33, 6–D9 (1991)
- On the Orbital Period Change of the Binary Pulsar PSR 1913+16.** *Thibault Damour & J. H. Taylor.* 366, 501, 9–C1 (1991)
- The Proper Motion of the Soft X-Ray-emitting Radio Pulsar PSR 0656+14.** *R. J. Thompson, Jr., F. A. Córdova, R. M. Hjellming, & E. B. Fomalont.* 366, L83, 11–E1 (1991)
- Optical and Radio Observations of the Binary Pulsar 1855+09: Evolution of Pulsar Magnetic Fields and Low-Mass White Dwarf Cooling.** *S. R. Kulkarni, S. Djorgovski, & A. R. Klemola.* 367, 221, 14–G4 (1991)
- Conditions for Accretion-induced Collapse of White Dwarfs.** *Ken'ichi Nomoto & Yoji Kondo.* 367, L19, 17–D1 (1991)
- Accretion Powered Pulsars: Continuum Spectra and Light Curves of Settling Accretion Mounds.** *David J. Burnard, Jonathan Arons, & Richard I. Klein.* 367, 575, 20–D10 (1991)
- Observation of Pulsar Wind: CCD Polarimetry of the Crab Nebula.** *F. C. Michel, P. A. Scowen, R. J. Dufour, & J. J. Hester.* 368, 463, 30–G1 (1991)
- On the Detectability of Pulsars in Close Binary Systems.** *Helen M. Johnston & Shrinivas R. Kulkarni.* 368, 504, 31–D1 (1991)
- No Evidence for TeV Gamma Radiation from 2CG 006–00.** *H. I. Nel, B. C. Raubenheimer, O. C. de Jager, R. Buccheri, M. Busetta, A. R. North, & C. Brink.* 368, 585, 32–D4 (1991)
- Dynamic Effects on Cyclotron Scattering in Pulsar Accretion Columns.** *J. J. Brainerd & P. Mészáros.* 369, 179, 38–B11 (1991)
- HEAO 3 Upper Limits to Pulsed Gamma-Ray Emission from PSR 1509–58 and PSR 0833–45.** *M. P. Ulmer, W. R. Purcell, W. A. Wheaton, & W. A. Mahoney.* 369, 485, 43–F12 (1991)
- Accretion Mechanisms in the Be/X-Ray Transient System A0535+26.** *C. Motch, L. Stella, E. Janot-Pacheco, & M. Mouchet.* 369, 490, 43–G5 (1991)
- Problems of Ultra-High-Energy Particle Acceleration in Cygnus X-3: A Critical Reappraisal.** *Abhas Mitra.* 370, 345, 51–E7 (1991)
- Mechanisms for Pulsar Eclipse.** *David Eichler.* 370, L27, 53–D11 (1991)
- A Relativistic Model of Pulsar Polarization.** *M. Blaskiewicz, J. M. Cordes, & I. Wasserman.* 370, 643, 56–D9 (1991)
- Multimission Observations of 4U 1538–52.** *L. R. Cominsky & F. Moraes.* 370, 670, 56–F10 (1991)
- Discovery of 111 Second Pulsation from the X-Ray Source Scutum X-1.** *K. Koyama, H. Kunieda, Y. Takeuchi, & Y. Tawara.* 370, L77, 59–D1 (1991)
- The Relativistic Rotation Transformation and the Corotating Source Model.** *S. Kichenassamy & R. A. Krikorian.* 371, 277, 63–E7 (1991)
- The Discovery of an X-Ray Burst and a Study of Aperiodic Variability from SMC X-1.** *L. Angelini, L. Stella, & N. E. White.* 371, 332, 64–C1 (1991)
- High-Precision Timing of Millisecond Pulsars. I. Astrometry and Masses of the PSR 1855+09 System.** *M. F. Ryba & J. H. Taylor.* 371, 739, 70–F9 (1991)
- Line Integrals of  $n_e$  and  $n_e^2$  at High Galactic Latitude.** *R. J. Reynolds.* 372, L17, 79–C1 (1991)
- Magnetic Two-Photon Scattering and Two-Photon Emission: Cross Sections and Redistribution Functions.** *S. G. Alexander & P. Mészáros.* 372, 554, 82–E11 (1991)
- Cyclotron Harmonics in Accreting Pulsars and Gamma-Ray Bursters: Effect of Two-Photon Processes.** *S. G. Alexander & P. Mészáros.* 372, 565, 82–F9 (1991)
- Oscillations of Rotating Neutron Stars.** *Tod E. Strohmayer.* 372, 573, 82–G5 (1991)
- Discovery of a Young, 267 Millisecond Pulsar in the Supernova Remnant W4.** *A. Wolszczan, J. M. Cordes, & R. J. Dewey.* 372, L99, 85–F1 (1991)
- Stationary Accelerators around Keplerian Disks of Aligned Magnetized Collapsed Objects: Pair Production and Gamma-Ray Emissioa.** *K. S. Cheng & M. Ruderman.* 373, 187, 88–C9 (1991)
- Transverse Conductivity of Relativistic Plasma in Oblique Electric and Magnetic Fields.** *Fulvio Melia & Marco Fatuzzo.* 373, 198, 88–D8 (1991)
- Rotation of the Neutron-Drip Superfluid in Pulsars: The Interaction and Pinning of Vortices.** *P. B. Jones.* 373, 208, 88–E6 (1991)
- Microstructure-determined Pulsar Dispersion Measures and the Problem of Profile Alignment.** *Timothy H. Hankins, Vera A. Izvekova, Valerii M. Malofeev, Joanna M. Rankin, Yuri P. Shitov, & Daniel R. Stinebring.* 373, L17, 91–C1 (1991)
- Mechanics and Energetics of Vortex Unpinning in Neutron Stars.** *Bennett K. Link & Richard I. Epstein.* 373, 592, 95–C11 (1991)
- Pulsar Timing at Low Radio Frequencies: Evidence for Superdispersion?** *J. A. Phillips.* 373, L63, 97–D11 (1991)
- Multipolar Magnetic Fields in Neutron Stars.** *Julian H. Krolik.* 373, L69, 97–E4 (1991)
- Timing Observations of the 8 Hour Binary Pulsar 2127+11C in the Globular Cluster M15.** *T. A. Prince, S. B. Anderson, S. R. Kulkarni, & A. Wolszczan.* 374, L41, 110–C1 (1991)
- Cyclotron Line Features in the Spectrum of the Transient X-Ray Pulsar X0115+634.** *F. Nagase, T. Dotani, Y. Tanaka, K. Makishima, T. Mihara, T. Sakao, H. Tsunemi, S. Kitamoto, K. Tamura, A. Yoshida, & H. Nakamura.* 375, L49, 124–B11 (1991)
- The X-Ray Properties of GX 301–2 (4U 1223–62).** *F. Haberl.* 376, 245, 128–A5 (1991)
- Detection of a Feature at 0.44 MeV in the Crab Pulsar Spectrum with FIGARO II: A Redshifted Positron Annihilation Line?** *E. Massaro, G. Matt, M. Salvati, E. Costa, P. Mandrou, M. Niel, J. F. Olive, T. Mineo, B. Sacco, L. Scarsi, G. Gerardi, B. Agrinier, E. Barouch, R. Comte, B. Parlier, & J. L. Masnou.* 376, L11, 130–B7 (1991)
- Transient Particle Acceleration in Strongly Magnetized Neutron Stars.** *Fulvio Melia & Marco Fatuzzo.* 376, 673, 134–F7 (1991)
- Search for TeV Emission from 4U 0115+63.** *D. J. Macomb, M. F. Cawley, D. J. Fegan, A. M. Hillas, P. W. Kwock, R. C. Lamb, M. J. Lang, D. A. Lewis, P. T. Reynolds, G. Vacanti, & T. C. Weekes.* 376, 738, 135–D12 (1991)
- Does the Vela Pulsar Have "Wisps"?** *M. F. Bietenholz, D. A. Frail, & T. H. Hankins.* 376, L41, 137–C1 (1991)
- An X-Ray Pulsator in the Direction of Molecular Cloud MBM 12 (Lynds 1457).** *K. Koyama, S. Takano, Y. Tawara, T. Matsumoto, K. Noguchi, Y. Fukui, T. Iwata, N. Ohashi, K. Tatematsu, N. Takahashi, T. Umemoto, K. W. Hodapp, J. Rayner, & K. Makishima.* 377, 240, 141–A1 (1991)
- Frequency Dependence of Pulsar Integrated Profiles.** *S. E. Thorsett.* 377, 263, 141–C1 (1991)
- Asymptotic Structure of Hydromagnetically Driven Relativistic Winds.** *Tzihong Chiueh, Zhi-yun Li, & Mitchell C. Begelman.* 377, 462, 145–D11 (1991)
- Gamma-Ray Observations of the Crab Nebula at TeV Energies.** *G. Vacanti, M. F. Cawley, E. Colombo, D. J. Fegan, A. M. Hillas, P. W. Kwock, M. J. Lang, R. C. Lamb, D. A. Lewis, D. J. Macomb, K. S. O'Flaherty, P. T. Reynolds, & T. C. Weekes.* 377, 467, 145–E4 (1991)
- Collisions of Giant Stars with Compact Objects: Hydrodynamical Calculations.** *Frederic A. Rasio & Stuart L. Shapiro.* 377, 559, 146–F1 (1991)
- PSR 0540+23 Revisited: Three Components, Drifting Subpulses, and Mode Switching.** *Leszek A. Nowakowski.* 377, 581, 147–A1 (1991)

- On the Nature and Evolution of the Windy Binary Pulsar PSR 1744–24A. *Jacob Shaham & Marco Tavani*. 377, 588, 147-A11 (1991)
- The Contribution of Light Bending and Redshift to the Pulse Characteristics of a Pulsar in the Case of Smaller Neutron Stars. *R. C. Kapoor*. 378, 227, 153-G1 (1991)
- Magnetosphere of the Rotation-powered Pulsar: A DC Circuit Model. *Shinpei Shibata*. 378, 239, 154-A1 (1991)
- A Spectral Study of Four Millisecond Pulsars. *R. S. Foster, L. Fairhead, & D. C. Backer*. 378, 687, 161-A1 (1991)
- Very High Energy Gamma-Ray Emission from Accreting X-Ray Pulsars. *K. S. Cheng, K. N. Yu, T. Cheung, & M. M. Lau*. 379, 290, 166-F1 (1991)
- Searches for Millisecond Pulsations in Low-Mass X-Ray Binaries. *K. S. Wood, J. P. Norris, P. Hertz, B. A. Vaughan, P. F. Michelson, K. Mitsuda, W. H. G. Lewin, J. van Paradijs, W. Penninx, & M. van der Klis*. 379, 295, 166-F9 (1991)
- Neutron Star and Black Hole Binaries in the Galaxy. *Ramesh Narayan, Tsvi Piran, & Amotz Shemi*. 379, L17, 169-B11 (1991)
- A Model of Unpulsed Very High Energy Gamma Rays from the Crab Nebula and Pulsar. *P. W. Kwok, K. S. Cheng, & M. M. Lau*. 379, 653, 172-G1 (1991)
- Discovery of Periodic Eclipses in the X-Ray Pulsar 1H 0253+193. *Yuichi Kamata, Yuzuru Tawara, & Katsuji Koyama*. 379, L65, 175-C13 (1991)
- "Hidden" Millisecond Pulsars. *Marco Tavani*. 379, L69, 175-D5 (1991)
- The Rate of Neutron Star Binary Mergers in the Universe: Minimal Predictions for Gravity Wave Detectors. *E. S. Phinney*. 380, L17, 181-C6 (1991)
- The K Parameter and Evolution of the Radio Pulsars. *Wen Xu & Xinji Wu*. 380, 550, 185-A12 (1991)
- High-Precision Timing of Millisecond Pulsars. II. Astrometry, Orbital Evolution, and Eclipses of PSR 1957+20. *M. F. Ryba & J. H. Taylor*. 380, 557, 185-B7 (1991)
- LMC X-4: Ginga Observations and Search for Orbital Period Changes. *A. Levine, S. Rappaport, A. Putney, R. Corbet, & F. Nagase*. 381, 101, 190-C7 (1991)
- A Model of Pulsed Gamma Radiation from the X-Ray Binary Hercules X-1/HZ Herculis. *F. A. Aharonian & A. M. Atoyan*. 381, 220, 191-F8 (1991)
- Outflow Hydrodynamics in the Eclipsing Millisecond Pulsar Binaries PSR 1957+20 and PSR 1744–24A. *Marco Tavani & Leigh Brookshaw*. 381, L21, 194-C13 (1991)
- H I Absorption Measurements toward 15 Pulsars and the Radial Distribution of Diffuse Ionized Gas in the Galaxy. *D. A. Frail, J. M. Cordes, T. H. Hankins, & J. M. Weisberg*. 382, 168, 202-C10 (1991)
- Time Variability of Pulsar Dispersion Measures. *J. A. Phillips & A. Wolszczan*. 382, L27, 205-D1 (1991)
- Transient Particle Acceleration in Strongly Magnetized Neutron Stars. II. Effects Due to a Dipole Field Geometry. *Marco Fatuzzo & Fulvio Melia*. 382, 570, 208-E10 (1991)
- Neutron Star Crustal Plate Tectonics. II. Evolution of Radio Pulsar Magnetic Fields. *M. Ruderman*. 382, 576, 208-F4 (1991)
- Neutron Star Crustal Plate Tectonics. III. Cracking, Glitches, and Gamma-Ray Bursts. *M. Ruderman*. 382, 587, 208-G3 (1991)
- The Origin of the Planet around PSR 1829–10. *Takashi Nakamura & Tsvi Piran*. 382, L81, 211-C13 (1991)
- Deep VLA Images of Globular Clusters. *Helen M. Johnston, Shrinivas R. Kulkarni, & W. M. Goss*. 382, L89, 211-D11 (1991)
- Decrease in the Orbital Period of Hercules X-1. *John E. Deeter, Paul E. Boynton, Sigenori Miyamoto, Shunji Kitamoto, Fumiaki Nagase, & Nobuyuki Kawai*. 383, 324, 216-C1 (1991)
- Evolution of Compact Binary Systems with X-Ray Heating. *Amos Harpaz & Saul Rappaport*. 383, 739, 223-D3 (1991)
- Formation of Dense Charged Bunches in Vacuum Gaps. *F. Curtis Michel*. 383, 808, 224-C6 (1991)
- Gamma-Ray Bursts from Sheared Alfvén Waves. *Fulvio Melia & Marco Fatuzzo*. 383, L57, 226-D1 (1991)
- X-Ray and Radio Pulse Phase Comparison for PSR 1509–58. *N. Kawai, R. Okayasu, W. Brinkmann, R. Manchester, A. G. Lyne, & N. D'Amico*. 383, L65, 226-D12 (1991)

## QUANTUM MECHANICS

- Theoretical Determination of the Spectroscopic Constants of the MgC Molecule. *Marcos A. Castro, Sylvio Canuto, & Florian Müller-Plathe*. 367, L69, 22-D3 (1991)
- Recalculation of Radial Matrix Integrals for the Electric Dipole Transitions in Hydrogen. *G. P. Malik, Usha Malik, & Vijaya S. Varma*. 371, 418, 65-D1 (1991)
- Transverse Conductivity of a Relativistic Plasma in Oblique Electric and Magnetic Fields. *Fulvio Melia & Marco Fatuzzo*. 373, 198, 88-D8 (1991)
- A New Gravitational Interaction of Cosmological Importance. *David F. Crawford*. 377, 1, 138-B1 (1991)
- Gamma-Ray Bursts from Sheared Alfvén Waves. *Fulvio Melia & Marco Fatuzzo*. 383, L57, 226-D1 (1991)
- ## QUASARS
- Galaxies Clustering around QSOs with  $z = 0.9\text{--}1.5$  and the Origin of Blue Field Galaxies. *Paul Hintzen, W. Romanishin, & Francisco Valdes*. 366, 7, 1-B5 (1991)
- Comparison of VLBI Radio-Core and X-Ray Flux Densities of Extragalactic Radio Sources. *Steven D. Bloom & Alan P. Marscher*. 366, 16, 1-C5 (1991)
- Southern IRAS Quasar with Extreme Fe II Emission. *S. Lipari, F. D. Macchetto, & D. Golombek*. 366, L65, 11-C1 (1991)
- A Change in the Cluster Environments of Radio Galaxies with Cosmic Epoch. *G. J. Hill & S. J. Lilly*. 367, 1, 12-A13 (1991)
- The Redshift Distribution of Ly $\alpha$  Clouds and the Proximity Effect. *Limin Lu, Arthur M. Wolfe, & David A. Turnshek*. 367, 19, 12-C5 (1991)
- Accretion Disk Emission from a BL Lacertae Object. *Amri Wandell & C. Megan Urry*. 367, 78, 13-A5 (1991)
- A Technique for Using Radio Jets as Extended Gravitational Lensing Probes. *Philipp P. Kronberg, Charles C. Dyer, E. Margaret Burbidge, & Vesa T. Junkkarinen*. 367, L1, 17-B1 (1991)
- Universal Particle Acceleration. *J. I. Katz*. 367, 407, 18-E1 (1991)
- X-Ray Continuum and Evidence for an Iron Emission Line from the Quasar E1821+643. *T. Kii, O. R. Williams, T. Ohashi, H. Awaki, K. Hayashida, H. Inoue, H. Kondo, K. Koyama, F. Makino, K. Makishima, R. D. Saxon, G. C. Stewart, S. Takano, Y. Tanaka, & M. J. L. Turner*. 367, 455, 19-A11 (1991)
- Effect of a QSO on the Interstellar Medium of Its Host Galaxy. *Smita Shanbhag*. 367, 462, 19-B5 (1991)
- Dark Matter Decay and the Temperature of Lyman-Alpha Clouds. *D. W. Scrimgeour*. 367, L39, 22-A11 (1991)
- Lyman- $\alpha$  Companions to High-z Quasars. *Esther M. Hu, Antoinette Songaila, Lennox L. Cowie, & Alan Stockton*. 368, 28, 23-D9 (1991)
- A Study of Two Absorption-Line Complexes in the Quasar UM 402  $\equiv$  Q0207–003. *E. Joseph Wampler*. 368, 40, 23-E11 (1991)
- Expansion-cooled Lyman-Alpha Clouds. *Robert C. Duncan, Ethan T. Vishniac, & Jeremiah P. Ostriker*. 368, L1, 28-B1 (1991)
- BL Lacertae Objects and Radio-loud Quasars within an Evolutionary Unified Scheme. *F. Vagnetti, E. Giallongo, & A. Cavaliere*. 368, 366, 29-E11 (1991)
- A New Survey for Quasar Clustering. *Patrick S. Osmer & Paul C. Hewitt*. 75, 273, 4-E9 (1991)
- An Optical Catalog of Extragalactic Emission-Line Objects Similar to Quasi-stellar Objects. *A. Hewitt & G. Burbidge*. 75, 297, 5-A5 (1991)
- Infrared Polarimetry of Quasars. *Michael L. Sitko & Yudong Zhu*. 369, 106, 37-C5 (1991)
- First Results from the Faint Object Camera: Images of the Gravitational Lens System G2237+0305. *P. Crane, R. Albrecht, C. Barbieri, J. C. Blades, A. Bokensberg, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kanperman, I. R. King, F. Macchetto, C. D. Mackay, F. Paresce, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, & W. B. Sparks*. 369, L59, 46-A7 (1991)
- Spatially Resolved Optical Images of High-Redshift Quasi-stellar Objects. *Timothy M. Heckman, Matthew D. Lehnert, Wil van Breugel, & George K. Miley*. 370, 78, 48-A7 (1991)
- An Ultraviolet Atlas of Quasar and Blazar Spectra. *A. L. Kinney, R. C. Bohlin, J. C. Blades, & D. G. York*. 75, 645, 10-C7 (1991)

- Structure and Kinematics of the Broad-Line Regions in Active Galaxies from *IUE* Variability Data. *Anuradha P. Koratkar & C. Martin Gaskell.* 75, 719, 11-B5 (1991)
- The Shape of the Ultraviolet Continuum of Quasars and Intergalactic Dust. *F. H. Cheng, C. Martin Gaskell, & Anuradha P. Koratkar.* 370, 487, 54-D9 (1991)
- High-Resolution Spectroscopy of Q1100–264 Again. *R. F. Carswell, K. M. Lanzetta, H. C. Parnell, & J. K. Webb.* 371, 36, 60-E1 (1991)
- Quasars and Active Galactic Nuclei in Rich Environments. II. The Evolution of Radio-loud Quasars. *E. Ellingson, H. K. C. Yee, & R. F. Green.* 371, 49, 60-F7 (1991)
- Correlated Radio and Optical Asymmetries in Powerful Radio Sources. *Patrick J. McCarthy, Wil van Breugel, & Vijay K. Kapahi.* 371, 478, 67-D11 (1991)
- Multifrequency VLA, VLBI, and Single-Dish Observations of the Quasar 4C 39.25. *Alan P. Marscher, Yun Fei Zhang, David B. Shaffer, Hugh D. Aller, & Margo F. Aller.* 371, 491, 67-E12 (1991)
- OX 169: Evidence for a Recent Merger. *Alan Stockton & Tony Farnham.* 371, 525, 68-A13 (1991)
- A Comparison of C IV and H $\beta$  Broad Emission-Line Profiles in Low-Redshift Active Galactic Nuclei. *Michael R. Corbin.* 371, L51, 73-B1 (1991)
- The Formation of Galaxies and Quasars in a Texture-seeded Cold Dark Matter Cosmogony. *Andrew K. Gooding, David N. Spergel, & Neil Turok.* 372, L5, 79-A13 (1991)
- Evidence for Structure in the Distribution of Active Galactic Nuclei with  $z < 0.05$ . *Michael J. Longo.* 372, L59, 85-B11 (1991)
- Evolution of the Luminosity Function of Quasar Accretion Disks. *David M. Caditz, Vahé Petrosian, & Amri Wandel.* 372, L63, 85-C1 (1991)
- Discovery of an Infrared Nucleus in Cygnus A: An Obscured Quasar Revealed? *S. Djorgovski, N. Weir, K. Matthews, & J. R. Graham.* 372, L67, 85-C5 (1991)
- Correlated Radio and Optical Variability in the BL Lacertae Object 0716+714. *A. Quirrenbach, A. Witzel, S. Wagner, F. Sanchez-Pons, T. P. Krichbaum, R. Wegner, K. Anton, U. Erkens, M. Hachnelt, J. A. Zensus, & K. J. Johnston.* 372, L71, 85-C9 (1991)
- Comparisons of the Emission-Line and Continuum Properties of Broad Absorption Line and Normal Quasi-stellar Objects. *Ray J. Weymann, Simon L. Morris, Craig B. Foltz, & Paul C. Hewett.* 373, 23, 86-C13 (1991)
- Physical Models for the Hypothesized  $F(\nu) \propto \nu^{-1}$  Infrared to X-Ray Continuum of Quasi-stellar Objects. *Wayne A. Stein.* 373, 54, 86-F4 (1991)
- The Ultraviolet Spectrum and Continuum Energy Distribution of the Bright Quasar H1821+643. *Michiel Kolman, Jules P. Halpern, Chris R. Shrader, & Alexei V. Filippenko.* 373, 57, 86-F8 (1991)
- A Wide-Field Multicolor Survey for High-Redshift Quasars,  $z \geq 2.2$ . I. Photometric Catalog and Survey Selection Function. *Stephen J. Warren, Paul C. Hewett, Michael J. Irwin, & Patrick S. Osmer.* 76, 1, 24-B1 (1991)
- A Wide-Field Multicolor Survey for High-Redshift Quasars,  $z \geq 2.2$ . II. The Quasar Catalog. *Stephen J. Warren, Paul C. Hewett, & Patrick S. Osmer.* 76, 23, 24-D3 (1991)
- A High Signal-to-Noise Ratio Composite Quasar Spectrum. *Paul J. Francis, Paul C. Hewett, Craig B. Foltz, Frederic H. Chaffee, Ray J. Weymann, & Simon L. Morris.* 373, 465, 93-F10 (1991)
- Analysis of C IV Absorption Lines from Clouds at High Redshifts. *Wei Peng & Jon C. Weisheit.* 373, 471, 93-G4 (1991)
- Emission from the  $z = 2$  Damped Ly $\alpha$  Absorber toward Q1215+333. *Richard Elston, Jill Bechtold, James Lowenthal, & Marcia Rieke.* 373, L39, 97-B1 (1991)
- Synchrotron Emission from Shocked Relativistic Jets. III. Models for the Centimeter Wave Band Quiescent and Burst Emission from 3C 279 and OT 081. *P. A. Hughes, H. D. Aller, & M. F. Aller.* 374, 57, 98-F5 (1991)
- New Observations of the Gas Cloud Associated with the Quasar-Galaxy Pair 3C 232/NGC 3067. *John T. Stocke, James Case, Megan Donahue, J. Michael Shull, & Theodore P. Snow.* 374, 72, 98-G7 (1991)
- Gravitational Lens Interference. *J. B. Peterson & Toby Falk.* 374, L5, 103-C1 (1991)
- Broad Paschen-Alpha Emission in Two Extremely Infrared Luminous Seyfert 2 Galaxies. *Dean C. Hines.* 374, L9, 103-C7 (1991)
- The CfA Einstein Observatory Extended Deep X-Ray Survey. *F. A. Primini, S. S. Murray, J. Huchra, R. Schild, R. Burg, & R. Giacconi.* 374, 440, 104-E12 (1991)
- Broad Na D Emission in QSOs and the Profile of He I  $\lambda\lambda 5876$ . *Keith L. Thompson.* 374, 496, 105-C7 (1991)
- Quasars and Active Galactic Nuclei in Rich Environments. I. Fields Surrounding Optically Faint Quasars. *E. Ellingson, H. K. C. Yee, & R. F. Green.* 376, 455, 31-D2 (1991)
- Evolution of High-Redshift Lyman-Limit Absorption Systems. *Kenneth M. Lanzetta.* 375, 1, 111-A11 (1991)
- Optical Polarization of a Complete Sample of Radio Sources. *C. D. Impey, C. R. Lawrence, & S. Tapia.* 375, 46, 111-E10 (1991)
- Infrared Broad Emission Lines from an Obscured Quasar, IRAS 23060+0505. *Tadashi Nakajima, Nathaniel P. Carleton, & Minoru Nishida.* 375, L1, 117-A7 (1991)
- Gravitational Lensing and the Lyman-Alpha Forest. *Satoru Ikeuchi & Edwin L. Turner.* 375, 499, 119-A5 (1991)
- The Emission-Line Properties of Steep Radio Spectrum Quasars. *Michael R. Corbin.* 375, 503, 119-A11 (1991)
- Evidence for a Massive, Dark Gravitational Lensing Object in Q2345+007. *Robert C. Duncan.* 375, L41, 124-B1 (1991)
- Lyman-Alpha Depression of the Continuum from High-Redshift Quasars: A New Technique Applied in Search of the Gunn-Peterson Effect. *Edward B. Jenkins & Jeremiah P. Ostriker.* 376, 33, 125-D9 (1991)
- Bounds on the Enhancement of Quasar Counts by Lenses. *Israel Kovner.* 376, 70, 125-G8 (1991)
- The Einstein Observatory Extended Medium-Sensitivity Survey. II. The Optical Identifications. *John T. Stocke, Simon L. Morris, I. M. Gioia, T. MacCarano, R. Schild, A. Wolter, Thomas A. Fleming, & J. Patrick Henry.* 76, 813, 36-B1 (1991)
- Infrared and Visible Photometry of the Gravitational Lens System 2237+030. *Daniel Nadeau, H. K. C. Yee, W. J. Forrest, J. D. Garnett, Z. Ninkov, & J. L. Pipher.* 376, 430, 131-G1 (1991)
- QSO Absorption Systems and the Origin of the Ionizing Background at High Redshift. *Piero Madau.* 376, L33, 137-B4 (1991)
- Radio Source Orientation and the Angular Diameter-Redshift Relation. *L. I. Onuora.* 377, 36, 138-E1 (1991)
- The Origin of the Quasi-stellar Object Absorption Lines. *S. M. Viegas & R. B. Gruenwald.* 377, 39, 138-E5 (1991)
- Far-Ultraviolet Spectroscopy of the Quasar UM 675 with the Faint Object Spectrograph on the *Hubble Space Telescope*. *E. A. Beaver, E. M. Burbidge, Ross D. Cohen, Vesa T. Junkkarinen, Ronald W. Lyons, E. I. Rosenblatt, George F. Hartig, Bruce Margon, & A. F. Davidsen.* 377, L1, 143-B1 (1991)
- The Ultraviolet Absorption Spectrum of 3C 273. *J. N. Bahcall, B. T. Jannuzi, D. P. Schneider, G. F. Hartig, R. Bohlin, & V. Junkkarinen.* 377, L5, 143-B6 (1991)
- First Results from the Goddard High-Resolution Spectrograph: The Galactic Halo and the Ly $\alpha$  Forest at Low Redshift in 3C 273. *Simon L. Morris, Ray J. Weymann, Blair D. Savage, & Ronald L. Gilliland.* 377, L21, 143-C11 (1991)
- Optical Variability of Quasars: Statistics and Cosmological Properties. *E. Giallongo, D. Trevese, & F. Vagnetti.* 377, 345, 144-B6 (1991)
- Asymptotic Structure of Hydromagnetically Driven Relativistic Winds. *Tzihong Chiueh, Zhi-yun Li, & Mitchell C. Begelman.* 377, 462, 145-D11 (1991)
- A  $\sim 10$  Mpc Void in the Ly $\alpha$  Forest at  $z = 3.17$ . *Adam Dobrucki & Jill Bechtold.* 377, L69, 150-B10 (1991)
- Discovery of a Ly $\alpha$  Galaxy near a Damped Ly $\alpha$  Absorber at  $z = 2.3$ . *James D. Lowenthal, Craig J. Hogan, Richard F. Green, Adeline Caulet, Bruce E. Woodgate, Larry Brown, & Craig B. Foltz.* 377, L73, 150-C1 (1991)
- The Case Low-Dispersion Northern Sky Survey. XII. A Region in Southern Canes Venatici. *Peter Pesch, N. Sanduleak, & C. B. Stephenson.* 76, 1043, 40-B1 (1991)
- Confirmation of Dust in Damped Lyman-Alpha Systems. *Yichuan C. Pei, S. Michael Fall, & Jill Bechtold.* 378, 6, 151-B4 (1991)
- Neutrino-heated Stars and Broad-Line Emission from Active Galactic Nuclei. *James MacDonald, Todor Stanev, & Peter L. Biermann.* 378, 30, 151-D4 (1991)

- The EXOSAT High Galactic Latitude Survey. *P. Giommi, G. Tagliaferri, K. Beuermann, G. Branduardi-Raymont, R. Brissenden, U. Graser, K. O. Mason, J. D. P. Mittaz, P. Murdin, G. Pooley, H.-C. Thomas, & I. Tuohy.* 378, 77, 152-A5 (1991)
- Origin of Cosmic X-Ray Background Radiation. *Nobuo Terasawa.* 378, L11, 157-B8 (1991)
- Attenuation of Lyman-Alpha Emission by Dust in Damped Lyman-Alpha Systems. *Stéphane Charlot & S. Michael Fall.* 378, 471, 158-C7 (1991)
- Clusters of Galaxies Associated with Quasars. II. Galaxy Cluster Dynamics. *E. Ellingson, R. F. Green, & H. K. C. Yee.* 378, 476, 158-D1 (1991)
- First- and Second-Epoch VLBI Observations of the Gravitational Lens System 2016+112. *M. B. Heflin, M. V. Gorenstein, C. R. Lawrence, & B. F. Burke.* 378, 519, 158-G9 (1991)
- Persistence and Change in the Soft X-Ray Spectrum of the Quasar PG 1211+143. *Martin Elvis, P. Giommi, Belinda J. Wilkes, & Jonathan McDowell.* 378, 537, 159-B1 (1991)
- Superclustering at High Redshifts. *Michael J. West.* 379, 19, 163-C7 (1991)
- The Carbon Abundance of the Lyman-Alpha Clouds. *Limin Lu.* 379, 99, 164-C1 (1991)
- The Visual Wavelength Continua of Quasars: A Reexamination. *W. A. Stein.* 379, 107, 164-C11 (1991)
- Massive Star Formation and Superwinds in IRAS 19254–7245 (The "Superantennae"). *Luis Colina, Sebastian Lipari, & F. Macchetto.* 379, 113, 164-D5 (1991)
- X-Ray Irradiation of Interstellar Grains in Active Galaxies: Evaporation and Infrared Spectra. *G. Mark Voit.* 379, 122, 164-E1 (1991)
- A New Spectroscopic Survey for Damped Ly $\alpha$  Absorption Lines from High-Redshift Galaxies. *Kenneth M. Lanzetta, Arthur M. Wolfe, David A. Turnshek, Limin Lu, Richard G. McMahon, & Cyril Hazard.* 77, 1, 43-B1 (1991)
- Atomic Data for Resonance Absorption Lines. I. Wavelengths Longward of the Lyman Limit. *Donald C. Morton.* 77, 119, 45-B1 (1991)
- Small-Scale Fluctuations and Angular Correlations of the X-Ray Background in the HEAO 1 A-2 Energy Band: Constraints on Clustering of X-Ray Sources. *J. M. Martin-Mirone, G. De Zotti, E. A. Boldi, F. E. Marshall, L. Danese, A. Franceschini, & M. Persic.* 379, 507, 171-A4 (1991)
- Selection Effects in Optical Surveys for Gravitational Lenses. *Christopher S. Kochanek.* 379, 517, 171-B1 (1991)
- Statistics of Gravitational Lenses: The Uncertainties. *Shude Mao.* 380, 9, 176-B9 (1991)
- What Are the Gigahertz Peaked-Spectrum Radio Sources? *C. P. O'Dea, S. A. Baum, & C. Stanghellini.* 380, 66, 176-G5 (1991)
- The Origin of Quasar Correlations. *Neta A. Bahcall & Arati Chokshi.* 380, L9, 181-B11 (1991)
- 3C 345: Is the Variability of Quasars Nonlinear? *R. Vio, S. Cristiani, O. Leisi, & L. Salvadori.* 380, 351, 182-F1 (1991)
- A Catalog of Absorption in the Spectra of Quasi-stellar Objects. *V. Junkkarinen, A. Hewitt, & G. Burbidge.* 77, 203, 47-B1 (1991)
- Probing the Galactic Halo along the 3C 273 Sight Line Using IUE. *Geoffrey S. Burks, Donald G. York, J. Chris Blades, Ralph C. Bohlin, & Willem Wamsteker.* 381, 55, 189-F5 (1991)
- Depolarization Asymmetry in the Quasar 3C 47. *Illias Fernini, J. Patrick Leahy, Jack O. Burns, & John P. Basari.* 381, 63, 189-G1 (1991)
- The Evolution of the Diffuse Cosmic Ultraviolet Background Constrained by Hubble Space Telescope Observations of 3C 273. *Satoru Ikeuchi & Edwin L. Turner.* 381, L1, 194-A9 (1991)
- The Systemic Redshift of the Quasar 1331+170. *R. F. Carswell, C. M. Mountain, D. J. Robertson, S. M. Beard, A. R. Glendinning, D. C. Laird, L. C. Lawrence, D. Montgomery, G. Pentland, D. A. Pickup, I. A. Smith, J. A. Bailey, A. Bridger, M. M. Casali, T. R. Geballe, P. Puxley, M. G. Smith, G. S. Wright, S. K. Ramsay, A. C. Baker, B. R. Espy, & M. J. Ward.* 381, L5, 194-B1 (1991)
- Spectroscopy of Spatially Extended Material around High-Redshift Radio-loud Quasars. *Timothy M. Heckman, Matthew D. Lehner, George K. Miley, & Wil van Breugel.* 381, 373, 195-D1 (1991)
- Spatially Resolved Spectroscopy of Lyman-Alpha and C IV in the Gravitational Lens 2237+030. *H. K. C. Yee & M. M. De Robertis.* 381, 386, 195-E1 (1991)
- Microlensing and the Structure of Active Galactic Nucleus Accretion Disks. *Kevin P. Rauch & Roger D. Blandford.* 381, L39, 199-B1 (1991)
- Near-Infrared Observations of the  $z \sim 2.3$  IRAS Source FSC 10214+4724. *B. T. Soifer, G. Neugebauer, J. R. Graham, K. Matthews, J. M. Mazzarella, C. J. Lonsdale, M. Rowan-Robinson, T. Broadhurst, A. Lawrence, & R. McMahon.* 381, L55, 199-D1 (1991)
- A Radio-quiet Galaxy at Redshift  $z = 3.409$ . *D. A. Turnshek, F. Macchetto, M. V. Bencke, C. Hazard, W. B. Sparks, & R. G. McMahon.* 382, 26, 200-D1 (1991)
- Are Quasar Redshifts Cosmological? *Aronn Dar.* 382, L1, 205-A7 (1991)
- Outflows Driven by Cosmic-Ray Pressure in Broad Absorption Line QSOs. *Mitchell C. Begelman, Martijn de Kool, & Marek Sikora.* 382, 416, 206-F9 (1991)
- Emission-Line and Continuum Properties of 92 Bright QSOs: Luminosity Dependence and Differences between Radio-selected and Optically Selected Samples. *Charles C. Steidel & Wallace L. W. Sargent.* 382, 433, 207-A1 (1991)
- Inference of the Extreme-Ultraviolet Continuum Shape of Quasars. *Wei Zheng.* 382, L55, 211-A11 (1991)
- IRAS 02366–3101: An Accretion Disk Candidate among Luminous IRAS Galaxies. *Luis Colina, Sebastian Lipari, & F. Macchetto.* 382, L63, 211-B7 (1991)
- The Confinement and Cosmological Evolution of Extragalactic Radio Source Components. *A. A. Ubachukwu, S. E. Okoye, & L. I. Onuora.* 383, 56, 212-F7 (1991)
- New Photoionization Models of Intergalactic Clouds. *Megan Donahue & J. Michael Shull.* 383, 511, 220-F1 (1991)
- Observations of Ca II Absorption along the Nearly Parallel Lines of Sight toward 3C 273 and SN 1991T. *David M. Meyer & Katherine C. Roth.* 383, L41, 226-B11 (1991)
- RADAR ASTRONOMY**
- Voyager 2 Test of the Radar Time-Delay Effect. *Timothy P. Krisher, John D. Anderson, & Anthony H. Taylor.* 373, 665, 96-C1 (1991)
- Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of Voyager 2. *T. P. Krisher, J. D. Anderson, D. D. Morabito, S. W. Asmar, S. E. Borutzki, M. L. Delitsky, A. C. Denmore, P. M. Eshe, G. D. Lewis, M. J. Maure, D. C. Roth, Y. H. Son, T. R. Spilker, D. N. Sweetnam, A. H. Taylor, G. L. Tyler, D. L. Gresh, & P. A. Rosen.* 375, L57, 124-C6 (1991)
- RADIAL VELOCITIES**
- Radial Velocity Distribution and Line Strengths of 33 Carbon Stars in the Galactic Bulge. *Neil D. Tyson & R. Michael Rich.* 367, 547, 20-B6 (1991)
- The Halo of the Large Magellanic Cloud: Kinematics of the CH Stars. *A. P. Cowley & F. D. A. Hartwick.* 373, 80, 87-A8 (1991)
- Radial Velocities of 26 Northern Milky Way Cepheids. *Mark R. Metzger, John A. R. Caldwell, James K. McCarthy, & Paul L. Schechter.* 76, 803, 35-G3 (1991)
- Probing Shock Models of CH $^+$  Formation. *Isabel Hawkins & Nahide Craig.* 375, 642, 120-F1 (1991)
- Dynamics of the Microwave-Decrement Cluster Abell 665. *William R. Oegerle, Michael J. Fitchett, John M. Hill, & Paul Hintzen.* 376, 46, 125-E10 (1991)
- Radial Velocity Measurements in the Pleiades. *T. Liu, Kenneth A. Janes, & T. M. Bania.* 377, 141, 139-F7 (1991)
- RADIATION MECHANISMS**
- Comparison of VLBI Radio-Core and X-Ray Flux Densities of Extragalactic Radio Sources. *Steven D. Bloom & Alan P. Marscher.* 366, 16, 1-C5 (1991)
- Cosmic X-Ray Background from Hot Gas. *R. D. Rogers & G. B. Field.* 366, 22, 1-C13 (1991)
- Ginga Observations of Three X-Ray-luminous Galaxies: NGC 4472, NGC 4636, and NGC 3998. *H. Awaki, K. Koyama, H. Kunieda, S. Takano, Y. Tawara, & T. Ohashi.* 366, 88, 2-B8 (1991)

- Far-Infrared Observations and the Structure of Wolf-Rayet Ring Nebulae. *A. P. Marston*. 366, 181, 3-C9 (1991)
- Compton Scattering of Gamma Rays in Optically Thick Media. *Magda Zdziarska & Andrzej A. Zdziarski*. 366, 233, 3-G13 (1991)
- On the Nature of Soft Gamma Repeaters. *J. P. Norris, P. Hertz, K. S. Wood, & C. Kouveliotou*. 366, 240, 4-A8 (1991)
- Coronal Loop Heating by Wave-Particle Interactions. *Altair S. de Assis & King H. Tsui*. 366, 324, 5-B1 (1991)
- Bursts of Gamma Rays from Compton Scattering at Cosmological Distances. *Andrzej A. Zdziarski, Roland Svensson, & Bohdan Paczyński*. 366, 343, 7-B3 (1991)
- H II Regions in M82: High-Resolution Millimeter Continuum Observations. *J. E. Carlstrom & Philipp P. Kronberg*. 366, 422, 8-B1 (1991)
- A Detailed Optical Study of Kepler's Supernova Remnant. *William P. Blair, Knox S. Long, & Olaf Vancura*. 366, 484, 9-A1 (1991)
- Monte Carlo Simulation of Comptonization in Plasma Accreting onto Neutron Stars. *Tomoyuki Hanawa*. 366, 495, 9-B9 (1991)
- Nonthermal X-Ray Emission from Winds of OB Supergiants. *Wan Chen & Richard L. White*. 366, 512, 9-D1 (1991)
- Universal Particle Acceleration. *J. I. Katz*. 367, 407, 18-E1 (1991)
- Cosmic Backgrounds from Primeval Dust. *J. R. Bond, B. J. Carr, & C. J. Hogan*. 367, 420, 18-F1 (1991)
- Structure of Thermal Pair Clouds around Gamma-Ray-emitting Black Holes. *Edison P. Liang*. 367, 470, 19-C1 (1991)
- Faraday Rotation and Physical Conditions in the Crab Nebula. *M. F. Bietenholz & P. P. Kronberg*. 368, 231, 26-A1 (1991)
- Nonthermal Radio Emission from the X-Ray-Bright K5 IV Star 1E 1751+7046. *Stephen L. Skinner*. 368, 272, 26-D11 (1991)
- Saturation of the Synchrotron Megamaser. *André R. Crusius-Wätzl*. 368, 390, 30-A1 (1991)
- On the Observability of the Gamma-Ray Line Flux from Dark Matter Annihilation. *S. Rudaz & F. W. Stecker*. 368, 406, 30-B5 (1991)
- An Infrared Analysis of Puppis A. *Richard G. Arendt, Eli Dwek, & Robert Petre*. 368, 474, 31-A7 (1991)
- Formulae for the Cyclotron Luminosity of Magnetized Plasma Slabs. *G. Channugam & Steven H. Langer*. 368, 580, 32-C11 (1991)
- Infrared Polarimetry of Quasars. *Michael L. Sitko & Yudong Zhu*. 369, 106, 37-C5 (1991)
- A Nonthermal Radio Halo Surrounding M82. *E. R. Seaquist & Nils Odegaard*. 369, 320, 41-F13 (1991)
- Luminosity Enhancement Factor for Thermal Comptonization and the Electron Energy Balance. *C. D. Dermer, E. P. Liang, & E. Canfield*. 369, 410, 42-G5 (1991)
- Problems of Ultra-High-Energy Particle Acceleration in Cygnus X-3: A Critical Reappraisal. *Abbas Mirza*. 370, 345, 51-E7 (1991)
- Polarization of Astronomical Maser Radiation. *Moshe Elitzur*. 370, 407, 52-C12 (1991)
- Synchrotron Radiation with Radiation Reaction. *Robert W. Nelson & Ira Wasserman*. 371, 265, 63-D7 (1991)
- Ultraviolet Variability of NGC 5548: Dynamics of the Continuum Production Region and Geometry of the Broad-Line Region. *J. H. Krolik, Keith Horne, T. R. Kallman, M. A. Malkan, R. A. Edelson, & G. A. Kriss*. 371, 541, 68-C6 (1991)
- Supernova Remnant 1987A. *Ding Luo & Richard McCray*. 372, 194, 76-D1 (1991)
- Magnetic Two-Photon Scattering and Two-Photon Emission: Cross Sections and Redistribution Functions. *S. G. Alexander & P. Mészáros*. 372, 554, 82-E11 (1991)
- Cyclotron Harmonics in Accreting Pulsars and Gamma-Ray Bursters: Effect of Two-Photon Processes. *S. G. Alexander & P. Mészáros*. 372, 565, 82-F9 (1991)
- Physical Models for the Hypothesized  $F(v) \propto v^{-1}$  Infrared to X-Ray Continuum of Quasi-stellar Objects. *Wayne A. Stein*. 373, 54, 86-F4 (1991)
- Relativistic Electron Populations in Cassiopeia A. *M. Anderson, L. Rudnick, P. Leppik, R. Perley, & R. Braun*. 373, 146, 87-G4 (1991)
- High-Energy X-Ray Production in a Boundary Layer of an Accreting Neutron Star. *Tomoyuki Hanawa*. 373, 222, 88-F9 (1991)
- Relativistic Motion in Gamma-Ray Bursts. *Julian H. Krolik & Edward A. Pier*. 373, 277, 89-D8 (1991)
- Direct Radiation from a Strong DC Electric Field. *Donat G. Wentzel*. 373, 285, 89-E3 (1991)
- The Bumps in the Spectral Energy Distribution of Active Galactic Nuclei. *Marcella Contini & Sueli M. Viegas*. 373, 405, 93-A9 (1991)
- He II Emission in Extragalactic H II Regions. *Donald R. Garnett, Robert C. Kennicutt, Jr., You-Hua Chu, & Evan D. Skillman*. 373, 458, 93-E14 (1991)
- Supernova Remnant Evolution in an Interstellar Medium with Evaporating Clouds. *Richard L. White & Knox S. Long*. 373, 543, 94-F7 (1991)
- Unsaturated Comptonization of Isotropic Photon Spectra by Relativistic Electrons. *Abraham Loeb, Christopher F. McKee, & Ofer Lahav*. 374, 44, 98-E5 (1991)
- Synchrotron Emission from Shocked Relativistic Jets. III. Models for the Centimeter Wave Band Quiescent and Burst Emission from 3C 279 and OT 081. *P. A. Hughes, H. D. Aller, & M. F. Aller*. 374, 57, 98-F5 (1991)
- Infrared Fluorescence of H<sub>2</sub> in NGC 6240: A Starburst Origin for the H<sub>2</sub> Luminosity. *Masuo Tanaka, Tetsuo Hasegawa, & Ian Gailey*. 374, 516, 105-E9 (1991)
- A Theory of Gamma-Ray Bursts Based on Resonant Compton Scattering. *Peter Vitello & Charles D. Dermer*. 374, 668, 107-D1 (1991)
- Cyclotron Resonant Scattering and Absorption. *Alice K. Harding & Joseph K. Daugherty*. 374, 687, 107-E8 (1991)
- Bremsstrahlung and Energetic Electrons in Supernovae. *Donald D. Clayton & Lih-Sin The*. 375, 221, 113-F12 (1991)
- Interrelation of Soft and Hard X-Ray Emissions during Solar Flares. I. Observations. *R. M. Winglee, A. L. Kiplinger, D. M. Zarro, G. A. Dulk, & J. R. Lemen*. 375, 366, 115-D13 (1991)
- Interrelation of Soft and Hard X-Ray Emissions during Solar Flares. II. Simulation Model. *R. M. Winglee, G. A. Dulk, P. L. Bornmann, & J. C. Brown*. 375, 382, 115-F1 (1991)
- Variable Soft X-Ray Excesses in Active Galactic Nuclei from Non-thermal Electron-Positron Pair Cascades. *Andrzej A. Zdziarski & Paolo S. Coppi*. 376, 480, 132-D5 (1991)
- Gamma-Ray Observations of the Crab Nebula at TeV Energies. *G. Vacanti, M. F. Cawley, E. Colombo, D. J. Fegan, A. M. Hillas, P. W. Kwock, M. J. Lang, R. C. Lamb, D. A. Lewis, D. J. Macomb, K. S. O'Flaherty, P. T. Reynolds, & T. C. Weekes*. 377, 467, 145-E4 (1991)
- Isothermal, Compton-heated Coronae above Accretion Disks. *Eve C. Ostriker, Christopher F. McKee, & Richard I. Klein*. 377, 593, 147-B3 (1991)
- The O VII Soft X-Ray Spectrum and Its Application to Hot Plasmas in Astrophysics. *A. H. Gabriel, F. Bely-Dubau, P. Faucher, & L. W. Acton*. 378, 438, 156-D1 (1991)
- Coherent Radiation from Energetic Electron Streams via Collisionless Bremsstrahlung in Strong Plasma Turbulence. *James C. Weatherall & Gregory Benford*. 378, 543, 159-B8 (1991)
- The Visual Wavelength Continua of Quasars: A Reexamination. *W. A. Stein*. 379, 107, 164-C11 (1991)
- Very High Energy Gamma-Ray Emission from Accreting X-Ray Pulsars. *K. S. Cheng, K. N. Yu, T. Cheung, & M. M. Lau*. 379, 290, 166-F1 (1991)
- Center-to-Limb Variations of Characteristics of Solar Flare Hard X-Ray and Gamma-Ray Emission. *James M. McTiernan & Vahé Petrosian*. 379, 381, 167-F11 (1991)
- What Are the Gigahertz Peaked-Spectrum Radio Sources? *C. P. O'Dea, S. A. Baum, & C. Stanghellini*. 380, 66, 176-G5 (1991)
- Emission at Cyclotron Harmonics Due to Coalescence of z-Mode Waves. *D. B. Melrose*. 380, 256, 179-C1 (1991)
- Radiative Widths and Splitting of Cyclotron Lines in Superstrong Magnetic Fields. *G. G. Pavlov, V. G. Bezchastnov, P. Mészáros, & S. G. Alexander*. 380, 541, 185-A1 (1991)
- Einstein Observatory SSS and MPC Observations of the Complex X-Ray Spectra of Seyfert Galaxies. *T. J. Turner, K. Á. Weaver, R. F. Mushotzky, S. S. Holt, & G. M. Madejski*. 381, 85, 190-B1 (1991)
- Pair-Density Transitions in Accretion Disk Coronae. *Masaaki Kusunose & Shin Mineshige*. 381, 490, 196-G1 (1991)
- Millisecond Radio Structure of Weak-lined T Tauri Stars. *R. B. Phillips, C. J. Lonsdale, & E. D. Feigelson*. 382, 261, 203-D9 (1991)

- Multifrequency Observations of BL Lacertae in 1988. *N. Kawai, M. Matsuoka, J. N. Bregman, H. D. Aller, M. F. Aller, P. A. Hughes, S. A. Balbus, T. J. Balonek, K. C. Chambers, R. E. S. Clegg, S. D. Clements, R. J. Leacock, A. G. Smith, R. Goodrich, J. S. Miller, M. Hereld, M. G. Hoare, V. A. Hughes, G. K. Miley, G. H. Moriarty-Schieven, K. Matthews, G. Neugebauer, T. Ohashi, P. F. Roche, H. A. Thronson, E. Valtorta, H. Teranishi, J. R. Webb, B. J. Wills, & D. Wills.* 382, 508, 207-G8 (1991)
- The Ultraviolet Spectra of Nearby Radio Galaxies. *William C. Keel & Rogier A. Windhorst.* 383, 135, 213-F3 (1991)
- Spectral Signatures of the MeV–PeV Radiation from Accreting Neutron Stars. *B. Rudak & P. Mészáros.* 383, 269, 215-E3 (1991)
- Multifrequency Radio Observations of Cygnus A: Spectral Aging in Powerful Radio Galaxies. *C. L. Carilli, R. A. Perley, J. W. Dreher, & J. P. Leahy.* 383, 554, 221-B9 (1991)
- EXOSAT* Observations of the Seyfert 1 Galaxy NGC 3516. *K. K. Ghosh & S. Soundararajaperumal.* 383, 574, 221-D1 (1991)
- Supernova Remnants in Dense Clouds. I. Blast-Wave Dynamics and X-Ray Irradiation. *B. T. Draine & D. T. Woods.* 383, 621, 222-A6 (1991)
- High-Resolution Spectroscopy of Partially Ionized Gas around H II Regions. *Joseph S. Onello, J. A. Phillips, & Yervant Terzian.* 383, 693, 222-G6 (1991)
- X Marks the Spot: Distribution and Excitation of Unidentified Molecules in the Red Rectangle. *Gary D. Schmidt & Adolf N. Witt.* 383, 698, 222-G12 (1991)
- Formation of Dense Charged Bunches in Vacuum Gaps. *F. Curtis Michel.* 383, 808, 224-C6 (1991)
- RADIATIVE TRANSFER**
- Radiative Transfer in Astronomical Masers. III. Filamentary Masers. *Moshe Elitzur, Christopher F. McKee, & David J. Hollenbach.* 367, 333, 16-B10 (1991)
- Extinction and Polarization of Transmitted Light by Partially Aligned Nonspherical Grains. *Mikhail I. Mishchenko.* 367, 561, 20-C8 (1991)
- Accretion Powered Pulsars: Continuum Spectra and Light Curves of Settling Accretion Mounds. *David J. Burnard, Jonathan Arons, & Richard I. Klein.* 367, 575, 20-D10 (1991)
- The Use of Iteration Factors for Temperature Correction in a Stellar Atmosphere When Convective Transport Is Present. *L. Crivellari & E. Simonneau.* 367, 612, 20-G10 (1991)
- Instabilities in Line-driven Stellar Winds. V. Effect of an Optically Thick Continuum. *S. P. Owocki & G. B. Rybicki.* 368, 261, 26-C11 (1991)
- Axissymmetric Models of Circumstellar Dust Shells. *Alan J. Collison & John D. Fix.* 368, 545, 31-G7 (1991)
- The Appearance of Highly Relativistic, Spherically Symmetric Stellar Winds. *Marek A. Abramowicz, Igor D. Novikov, & Bohdan Paczyński.* 369, 175, 38-B5 (1991)
- Dynamic Effects on Cyclotron Scattering in Pulsar Accretion Columns. *J. J. Brainerd & P. Mészáros.* 369, 179, 38-B11 (1991)
- Scattering of Acoustic Waves from a Magnetic Flux Tube Embedded in a Radiating Fluid. *T. J. Bogdan & M. Knöller.* 369, 219, 38-F1 (1991)
- Thomson Scattering in a Magnetic Field. II. Arbitrary Field Orientation. *Barbara A. Whitney.* 369, 451, 43-C10 (1991)
- Opacity Effects on the Radiative Losses of Coronal Loops. *N. P. M. Kuin & A. I. Poland.* 370, 763, 57-G11 (1991)
- The Escape of Lyman-Alpha Radiation from a Multiphase Interstellar Medium. *David A. Neufeld.* 370, L85, 59-D13 (1991)
- Emission from Dust in Visual Reflection Nebulae at Infrared and Submillimeter Wavelengths. *Sean C. Casey.* 371, 183, 62-D1 (1991)
- Comptonization of Gamma Rays by Cold Electrons. *Yueming Xu, Randy R. Ross, & Richard McCray.* 371, 280, 63-E11 (1991)
- Aberration and Advection Effects in Expanding Spherically Symmetric Shells. *A. Peraiah.* 371, 673, 70-A1 (1991)
- Thomson Scattering in a Magnetic Field. I. Field along z. *Barbara A. Whitney.* 375, 1293, 22-F1 (1991)
- Stability, Structure, and Evolution of Cool Loops. *P. S. Cally & T. D. Robb.* 372, 329, 78-A11 (1991)
- Cyclotron Harmonics in Accreting Pulsars and Gamma-Ray Bursters: Effect of Two-Photon Processes. *S. G. Alexander & P. Mészáros.* 372, 565, 82-F9 (1991)
- Non-LTE Analysis of the Ospe/WN9 Star HDE 269227 (R84). *Werner Schmutz, Claus Leitherer, Ivan Hubeny, Manfred Vogel, Wolf-Rainer Hamann, & Ulf Wesselowski.* 372, 664, 84-A1 (1991)
- Heating Solar Coronal Holes. *E. N. Parker.* 372, 719, 84-E11 (1991)
- Size and Density Distribution of Very Small Dust Grains in the Barnard 5 Cloud. *Dariusz C. Lis & Chun Ming Leung.* 372, L107, 85-F9 (1991)
- Collisional Pumping of H<sub>2</sub>O Masers in Star-forming Regions. *Nikolaos D. Kylafis & Colin A. Norman.* 373, 525, 94-D13 (1991)
- Ionization by High-Energy Particles and the Electron Scattering Opacity in Supernovae. *Douglas A. Swartz.* 373, 604, 95-D11 (1991)
- Bowen Fluorescence in AM Herculis Stars. *Jonathan Schachter, Alexei V. Filippenko, Steven M. Kahn, & Frits B. S. Paerels.* 373, 633, 95-G4 (1991)
- Thermal and Mechanical Damping of Solar p-Modes. *Peter Goldreich & Pawan Kumar.* 374, 366, 102-F1 (1991)
- Flux-limited Diffusion in a Scattering Medium. *Fulvio Melia & Gregory J. Zylstra.* 374, 732, 108-B9 (1991)
- Stellar Occultation of Polarized Light from Circumstellar Electrons. II. Flat Envelopes Viewed at Arbitrary Inclination. *Geoffrey K. Fox & John C. Brown.* 375, 300, 114-F1 (1991)
- Spectroscopic Study of Direct and Dust-scattered Line Emission in the HH 1-HH 2 System. *J. Solf & K. H. Böhm.* 375, 618, 120-D3 (1991)
- Model Atmospheres and X-Ray Spectra of Bursting Neutron Stars. *Jerzy Madej.* 376, 161, 127-A4 (1991)
- The Phase Mixing of Alfvén Waves, Coordinated Modes, and Coronal Heating. *E. N. Parker.* 376, 355, 129-C11 (1991)
- The Effects of Thermal Radiation on Some General Relativistic Stellar Models. *J. M. Aguirregabiria, J. Ibáñez, A. Di Prisco, & L. Herrera.* 376, 662, 134-E8 (1991)
- Energy Deposition by X-Ray Photoelectrons into Interstellar Molecular Clouds. *G. Mark Voit.* 377, 158, 140-A1 (1991)
- Low-Density Photodissociation Regions. *David J. Hollenbach, Takamasa Takahashi, & A. G. G. M. Tielens.* 377, 192, 140-C11 (1991)
- Neutral Oxygen in Planetary Nebulae: Probing Radiative Transfer and Nebular Structure. *Michael G. Richer, Marshall L. McCall, & Peter G. Martin.* 377, 210, 140-E1 (1991)
- Continuum Opacity Produced by Spectral Lines in Supernovae and Similar Explosions. *Robert V. Wagoner, Christopher A. Perez, & Mary Vasu.* 377, 639, 147-E12 (1991)
- Energy Balance in the Solar Transition Region. II. Effects of Pressure and Energy Input on Hydrostatic Models. *J. M. Fontenla, E. H. Avrett, & R. Loeser.* 377, 712, 148-E1 (1991)
- On Spectra of X-Ray Bursters in the Expansion Phase. I. *I. Lapidus.* 377, L93, 150-E1 (1991)
- Radiative-hydrodynamical Simulations of Accretion Disk Coronae. *Fulvio Melia, Gregory J. Zylstra, & Bruce Fryxell.* 377, L101, 150-E11 (1991)
- Constraints on the Physical Properties of Optical Bullets in SS 433. *John C. Brown, Joseph P. Cassinelli, & George W. Collins II.* 378, 307, 154-G1 (1991)
- Attenuation of Lyman-Alpha Emission by Dust in Damped Lyman-Alpha Systems. *Stéphane Charlot & S. Michael Fall.* 378, 471, 158-C7 (1991)
- Radiation Transport in Dust in Disk Geometry. I. Application to Externally Heated Interstellar Clouds. *George F. Spagna, Jr., Chun Ming Leung, & Michael P. Egan.* 379, 232, 166-A5 (1991)
- Echo Images of Broad-Line Regions in Active Galactic Nuclei. *William F. Welsh & Keith Horne.* 379, 586, 172-A1 (1991)
- Stellar Occultation of Polarized Light from Circumstellar Electrons. III. General Axisymmetric Envelopes. *Geoffrey K. Fox.* 379, 663, 173-A1 (1991)
- Models for Light Scattering by Dust around Herbig-Haro Objects. *Alberto Noriega-Crespo, Nuria Calvet, & Karl-Heinz Böhm.* 379, 676, 173-B1 (1991)
- Effects of Aberration and Advection on Line Formation. *A. Peraiah.* 380, 212, 178-F1 (1991)

- Irradiation of Accretion Disks around Young Objects. I. Near-Infrared CO Bands. *Nuria Calvet, Alberto Patiño, Gladis Magris C., & Paola D'Alessio.* 380, 617, 185-G8 (1991)
- Inferring Chromospheric Flare Heating from Hydrogen-Line Wings. *K. G. Gayley & R. C. Canfield.* 380, 660, 186-D1 (1991)
- Nonequilibrium Ionization Effects in Asymmetrically Heated Loops. *D. Spadaro, S. K. Antiochos, & J. T. Mariska.* 382, 338, 204-D1 (1991)
- The Temperature of the Circumstellar Envelope of Alpha Orionis. *Bernadette Rodgers & Alfred E. Glassgold.* 382, 606, 209-B1 (1991)
- Discrete Ordinate Solution of the Radiative Transfer Equation in the "Polarization Normal Wave Representation." *A. Kylling.* 383, 243, 215-C1 (1991)
- Spherical Accretion onto Black Holes: A Complete Analysis of Stationary Solutions. *Luciano Nobili, Roberto Turolla, & Luca Zampieri.* 383, 250, 215-C9 (1991)
- The Vertical Structure of T Tauri Accretion Disks. I. Heating by the Central Star. *Fabien Malbet & Claude Bertout.* 383, 814, 224-D1 (1991)
- A Model for the Infrared Emission from an OB Star Cluster Environment. *D. Leisawitz.* 77, 451, 51-B1 (1991)
- RADIO SOURCES: EXTENDED**
- Correlated Radio and Optical Asymmetries in Powerful Radio Sources. *Patrick J. McCarthy, Wil van Breugel, & Vijay K. Kapahi.* 371, 478, 67-D11 (1991)
- Diffuse Galactic Emission at Millimetric Wavelengths. *P. Andreani, G. Dall'Olgo, L. Martinis, L. Piccirillo, L. Pizzo, L. Rossi, & C. Vensurina.* 375, 148, 112-G5 (1991)
- The Brightness Temperature of the South Celestial Pole and the Temperature of the Cosmic Background Radiation Measured at 36.6 and 12 Centimeter Wavelength. *G. Sironi, G. Bonelli, & M. Limon.* 378, 550, 159-C1 (1991)
- Cosmic Microwave Background and Galactic Quadrupoles in the Millimeter Region. *Paolo de Bernardis, Silvia Masi, & Nicola Vittorio.* 382, 515, 208-A1 (1991)
- RADIO SOURCES: GALAXIES**
- H II Regions in M82: High-Resolution Millimeter Continuum Observations. *J. E. Carlstrom & Philipp P. Kronberg.* 366, 422, 8-B1 (1991)
- Detection of Polarized Ultraviolet Emission from the High-Redshift Radio Galaxy 3C 265. *Buell T. Jannuzzi & Richard Elston.* 366, L69, 11-C5 (1991)
- A Change in the Cluster Environments of Radio Galaxies with Cosmic Epoch. *G. J. Hill & S. J. Lilly.* 367, 1, 12-A13 (1991)
- A Technique for Using Radio Jets as Extended Gravitational Lensing Probes. *Philip P. Kronberg, Charles C. Dyer, E. Margaret Burbidge, & Vesa T. Junkkarinen.* 367, L1, 17-B1 (1991)
- Lyman- $\alpha$  Companions to High-z Quasars. *Esther M. Hu, Antoinette Songaila, Lennox L. Cowie, & Alan Stockton.* 368, 28, 23-D9 (1991)
- Fanaroff-Riley I Galaxies as the Parent Population of BL Lacertae Objects. II. Optical Constraints. *P. Padovani & C. M. Urry.* 368, 373, 29-F6 (1991)
- A Nonthermal Radio Halo Surrounding M82. *E. R. Seaquist & Nils Odegard.* 369, 320, 41-F13 (1991)
- First Results from the Faint Object Camera: Observations of PKS 0521-36. *F. Macchetto, R. Albrecht, C. Barbieri, J. C. Blades, A. Boksenberg, P. Crane, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kamperman, I. R. King, C. D. Mackay, F. Paresce, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, & W. B. Sparks.* 369, L55, 46-A1 (1991)
- The Escape of Lyman-Alpha Radiation from a Multiphase Interstellar Medium. *David A. Neufeld.* 370, L85, 59-D13 (1991)
- Multifrequency VLA, VLBI, and Single-Dish Observations of the Quasar 4C 39.25. *Alan P. Marscher, Yun Fei Zhang, David B. Shaffer, Hugh D. Aller, & Margo F. Aller.* 371, 491, 67-E12 (1991)
- Statistical Analysis of Power-Size-Redshift Distributions of Extragalactic Jets. *Alexander Rosen & Paul J. Wiita.* 371, 501, 67-F10 (1991)
- OX 169: Evidence for a Recent Merger. *Alan Stockton & Tony Farnham.* 371, 525, 68-A13 (1991)
- The Influence of High-Density Environment on the Radio-Far-Infrared Correlation of Spiral Galaxies. *T. K. Menon.* 372, 419, 81-A7 (1991)
- Gaseous Halos of Elliptical Galaxies, the Cosmic Evolution of Their Radio Sizes, and the Phenomenon of Compact Steep-Spectrum Sources. *Gopal-Krishna & Paul J. Wiita.* 373, 325, 92-B1 (1991)
- HST Observations of 3C 66B: A Double-stranded Optical Jet. *F. Macchetto, R. Albrecht, C. Barbieri, J. C. Blades, A. Boksenberg, P. Crane, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kamperman, I. R. King, C. D. Mackay, F. Paresce, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, W. B. Sparks, & G. K. Miley.* 373, L55, 97-C10 (1991)
- Deep Spectroscopy under High Spatial Resolution of the High-Redshift Radio Source 3CR 368: The Monster Elucidated. *F. Hammer, O. Le Fèvre, & D. Proust.* 374, 91, 99-B7 (1991)
- The Complete Sample of 1 Jansky BL Lacertae Objects. I. Summary Properties. *M. Stickel, P. Padovani, C. M. Urry, J. W. Fried, & H. Kühl.* 374, 431, 104-E1 (1991)
- Optical Polarization of a Complete Sample of Radio Sources. *C. D. Impey, C. R. Lawrence, & S. Tapia.* 375, 46, 111-E10 (1991)
- The Interstellar Medium of the Hot-Spot Galaxy NGC 2903. *James M. Jackson, Andreas Eckart, Murray Cameron, Wolfgang Wild, Paul T. P. Ho, Richard W. Pogge, & Andrew I. Harris.* 375, 105, 112-C9 (1991)
- Correlations between Far-Infrared, Radio, and Blue Luminosities of Spiral Galaxies. *J. J. Condon, M. L. Anderson, & G. Helou.* 376, 95, 126-B7 (1991)
- Radio Source Orientation and the Angular Diameter-Redshift Relation. *L. I. Onouva.* 377, 36, 138-E1 (1991)
- Compact Starbursts in Ultraluminous Infrared Galaxies. *J. J. Condon, Z.-P. Huang, Q. F. Yin, & T. X. Thuan.* 378, 65, 151-G5 (1991)
- Superclustering at High Redshifts. *Michael J. West.* 379, 19, 163-C7 (1991)
- What Are the Gigahertz Peaked-Spectrum Radio Sources? *C. P. O'Dea, S. A. Baum, & C. Stanghellini.* 380, 66, 176-G5 (1991)
- The Discovery of a Young Radio Galaxy at  $z = 2.390$ : Probing Initial Star Formation at  $z \lesssim 3.0$ . *Rogier A. Windhorst, David Burstein, Doug F. Mathis, Lyman W. Neuschaefer, F. Bertola, L. M. Buson, David C. Koo, Keith Matthews, Peter D. Barthel, & K. C. Chambers.* 380, 362, 182-G1 (1991)
- Bounds on Intergalactic Compact Objects from Observations of Compact Radio Sources. *Aggeliki Kassiola, Israel Kovner, & Roger D. Blandford.* 381, 6, 189-B4 (1991)
- The Starburst Ring around the Seyfert Nucleus in NGC 7469. *A. S. Wilson, T. T. Helfer, C. A. Haniff, & M. J. Ward.* 381, 79, 190-A6 (1991)
- 3C 390.3: Modeling Variable Profile Humps. *Wei Zheng, Sylvain Veilleux, & Steven A. Grandi.* 381, 418, 196-A1 (1991)
- Polarized Radio Emission from the Edge-on Spiral Galaxies NGC 891 and NGC 4565. *S. Sukumar & R. J. Allen.* 382, 100, 201-D1 (1991)
- The Extraordinary Radio Source 3C 442. *Neil F. Comins & Frazer N. Owen.* 382, 108, 201-E1 (1991)
- The Relationship between the Carbon Monoxide Intensity and the Radio Continuum Emission in Spiral Galaxies. *David S. Adler, Ronald J. Allen, & K. Y. Lo.* 382, 475, 207-D12 (1991)
- Fanaroff-Riley I Galaxies as the Parent Population of BL Lacertae Objects. III. Radio Constraints. *C. M. Urry, P. Padovani, & M. Stickel.* 382, 501, 207-F13 (1991)
- The Confinement and Cosmological Evolution of Extragalactic Radio Source Components. *A. A. Ubachukwu, S. E. Okoye, & L. I. Onouva.* 383, 56, 212-F7 (1991)
- The Ultraviolet Spectra of Nearby Radio Galaxies. *William C. Keel & Rogier A. Windhorst.* 383, 135, 213-F3 (1991)
- Multifrequency Radio Observations of Cygnus A: Spectral Aging in Powerful Radio Galaxies. *C. L. Carilli, R. A. Perley, J. W. Dreher, & J. P. Leahy.* 383, 554, 221-B9 (1991)
- RADIO SOURCES: GENERAL**
- Comparison of VLBI Radio-Core and X-Ray Flux Densities of Extragalactic Radio Sources. *Steven D. Bloom & Alan P. Marscher.* 366, 16, 1-C5 (1991)
- A New Catalog of 53,522 4.85 GHz Sources. *Robert H. Becker, Richard L. White, & Alan L. Edwards.* 75, 1, 1-B1 (1991)

- BL Lacertae Objects and Radio-loud Quasars within an Evolutionary Unified Scheme. *F. Vagnetti, E. Giallongo, & A. Cavaliere.* 368, 366, 29-E11 (1991)
- The Fourth MIT-Green Bank 5 GHz Survey. *Mark Griffith, Glen Langston, Mike Heflin, Sam Conner, & Bernard Burke.* 75, 801, 12-C5 (1991)
- The 87GB Catalog of Radio Sources Covering  $0^\circ < \delta < +75^\circ$  at 4.85 GHz. *P. C. Gregory & J. J. Condon.* 75, 1011, 17-A1 (1991)
- VLA and VLBI Angular Broadening Measurements: The Distribution of Interstellar Scattering at Low Galactic Latitudes. *A. L. Fey, S. R. Spangler, & J. M. Cordes.* 372, 132, 75-F1 (1991)
- Discovery of an Infrared Nucleus in Cygnus A: An Obscured Quasar Revealed? *S. Djorgovski, N. Weiz, K. Matthews, & J. R. Graham.* 372, L67, 85-C5 (1991)
- The Expansion of the Crab Nebula. *M. F. Bietenholz, P. P. Kronberg, D. E. Hogg, & A. S. Wilson.* 373, L59, 97-D5 (1991)
- The Emission-Line Properties of Steep Radio Spectrum Quasars. *Michael R. Corbin.* 375, 503, 119-A11 (1991)
- A Double Radio Source at the Center of the Outflow in L723. *Guillem Anglada, Robert Estalella, Luis F. Rodríguez, José M. Torrelles, Rosario López, & Jorge Cantó.* 376, 615, 134-A7 (1991)
- Does the Vela Pulsar Have "Wisps"? *M. F. Bietenholz, D. A. Frail, & T. H. Hankins.* 376, L41, 137-C1 (1991)
- An X-Ray and Radio Study of Steep-Spectrum Radio Sources. II. Four Fields from a 22 MHz Polar Cap Survey. *P. E. Dewdney, C. H. Costain, I. McHardy, A. G. Willis, D. E. Harris, & C. P. Stern.* 76, 1055, 40-D1 (1991)
- Location of the Thermal Continuum Source Sagittarius D. *Dariusz C. Lis.* 379, L53, 175-B10 (1991)
- The Galactic Center Radio Source Shines below the Compton Limit. *C. R. Gwinn, R. M. Danen, J. Middlecamp, L. M. Ozernoy, & T. Kh. Tran.* 381, L43, 199-B7 (1991)
- Emission-Line and Continuum Properties of 92 Bright QSOs: Luminosity Dependence and Differences between Radio-selected and Optically Selected Samples. *Charles C. Steidel & Wallace L. W. Sargent.* 382, 433, 207-A1 (1991)
- ### RADIO SOURCES: IDENTIFICATIONS
- Optical and Radio Observations of the Binary Pulsar 1855+09: Evolution of Pulsar Magnetic Fields and Low-Mass White Dwarf Cooling. *S. R. Kulkarni, S. Djorgovski, & A. R. Klemola.* 367, 221, 14-G4 (1991)
- The Fourth MIT-Green Bank 5 GHz Survey. *Mark Griffith, Glen Langston, Mike Heflin, Sam Conner, & Bernard Burke.* 75, 801, 12-C5 (1991)
- Deep Spectroscopy under High Spatial Resolution of the High-Redshift Radio Source 3CR 368: The Monster Elucidated. *F. Hammer, O. Le Fevre, & D. Proust.* 374, 91, 99-B7 (1991)
- Diffuse Galactic Emission at Millimetric Wavelengths. *P. Andreani, G. Dall'Olgo, L. Marinis, L. Piccirillo, L. Pizzo, L. Rossi, & C. Venturino.* 375, 148, 112-G5 (1991)
- An X-Ray and Radio Study of Steep-Spectrum Radio Sources. II. Four Fields from a 22 MHz Polar Cap Survey. *P. E. Dewdney, C. H. Costain, I. McHardy, A. G. Willis, D. E. Harris, & C. P. Stern.* 76, 1055, 40-D1 (1991)
- Detection of a New Carbon-Chain Molecule, CCO. *Masatoshi Ohishi, Hiroko Suzuki, Shin-ichi Ishikawa, Chikashi Yamada, Hideyo Kanamori, William M. Irvine, Ronald D. Brown, Peter D. Godfrey, & Norio Kaifu.* 380, L39, 181-E11 (1991)
- ### RADIO SOURCES: LINES
- VLA Radio Recombination Line Observations of Sagittarius A West. *D. A. Roberts, W. W. Goss, J. H. van Gorkom, & J. P. Leahy.* 366, L15, 6-B13 (1991)
- A Search for vibrationally excited  $H_2O$  at 68 GHz. *S. J. Petuchowski & C. L. Bennett.* 367, 168, 14-B4 (1991)
- Detection of  $^{13}C$  Isotopomers of  $HC_3N$  ( $J = 9-8$ ) in the Circumstellar Envelope of IRC +10216. *M. B. Bell & P. A. Feldman.* 367, L33, 17-E8 (1991)
- The Millimeter-Wave Spectrum of Highly vibrationally excited SiO. *R. Mollaaghatababa, C. A. Gottlieb, J. M. Vrtilek, & P. Thaddeus.* 368, L19, 28-D1 (1991)
- Astronomical Detection of  $H_2CCC$ . *J. Cernicharo, C. A. Gottlieb, M. Guélin, T. C. Killian, G. Paubert, P. Thaddeus, & J. M. Vrtilek.* 368, L39, 35-C7 (1991)
- Astronomical Detection of  $H_2CCCC$ . *J. Cernicharo, C. A. Gottlieb, M. Guélin, T. C. Killian, P. Thaddeus, & J. M. Vrtilek.* 368, L43, 35-C11 (1991)
- Radio Recombination Lines from Diffuse Interstellar Gas in the Galaxy. *J. C. Cersosimo & J. S. Onello.* 370, 225, 50-A5 (1991)
- Laboratory Detection of  $HC_9N$  Using a Fourier Transform Microwave Spectrometer. *Minoru Iida, Yasuhiro Ohshima, & Yasuki Endo.* 371, L45, 66-F7 (1991)
- The Dynamics and Physical Properties of the Cometary Nebula G29.96-0.02. *Douglas O. S. Wood & Ed Churchwell.* 372, 199, 76-D8 (1991)
- VLBI Observations of Interstellar Ammonia Masers. *Preethi Pratap, Karl M. Menten, Mark J. Reid, James M. Moran, & C. Malcolm Walmsley.* 373, L13, 91-B12 (1991)
- Interstellar Scattering Effects on the Detection of Narrow-Band Signals. *James M. Cordes & T. Joseph Lazio.* 376, 123, 126-D10 (1991)
- Molecular Outflows Associated with Young Stellar Objects in the L1641 Region of Orion. *James A. Morgan, E. Peter Schloerb, Ronald L. Snell, & John Bally.* 376, 618, 134-A12 (1991)
- The Dense Molecular Envelope around the Compact H II Region G5.89-0.39 (W28 A2). *Yolanda Gómez, Luis F. Rodríguez, Guido Garay, & James M. Moran.* 377, 519, 146-B9 (1991)
- The Discovery of a New, Very Strong, and Widespread Interstellar Methanol Maser Line. *Karl M. Menten.* 380, L75, 188-E1 (1991)
- High-Resolution Spectroscopy of Partially Ionized Gas around H II Regions. *Joseph S. Onello, J. A. Phillips, & Yervant Terzian.* 383, 693, 222-G6 (1991)
- ### RADIO SOURCES: SPECTRA
- Theoretical Determination of the Spectroscopic Constants of the MgC Molecule. *Marcos A. Castro, Sylvio Canuto, & Florian Müller-Plathe.* 367, L69, 22-D3 (1991)
- Lyman- $\alpha$  Companions to High-z Quasars. *Esther M. Hu, Antoinette Songaila, Lennox L. Cowie, & Alan Stockton.* 368, 28, 23-D9 (1991)
- Circular Polarization in 1612 MHz OH Maser Emission from OH/IR Stars. *Philip J. Zell & John D. Fix.* 369, 506, 44-A9 (1991)
- Multifrequency VLA Observations of Radio Continuum from IRAS 16293-2422. *R. Estalella, G. Anglada, L. F. Rodríguez, & G. Garay.* 371, 626, 69-C12 (1991)
- Relativistic Electron Populations in Cassiopeia A. *A. M. Anderson, L. Rudnick, P. Leppik, R. Perley, & R. Braun.* 373, 146, 87-G4 (1991)
- An X-Ray and Radio Study of Steep-Spectrum Radio Sources. II. Four Fields from a 22 MHz Polar Cap Survey. *P. E. Dewdney, C. H. Costain, I. McHardy, A. G. Willis, D. E. Harris, & C. P. Stern.* 76, 1055, 40-D1 (1991)
- A Spectral Study of Four Millisecond Pulsars. *R. S. Foster, L. Fairhead, & D. C. Backer.* 378, 687, 161-A1 (1991)
- What Are the Gigahertz Peaked-Spectrum Radio Sources? *C. P. O'Dea, S. A. Baum, & C. Stanghellini.* 380, 66, 176-G5 (1991)
- First Absolute Wind Measurements in the Middle Atmosphere of Mars. *Emmanuel Lellouch, Jeffrey J. Goldstein, Stephen W. Bougher, Gabriel Paubert, & Jan Rosenqvist.* 383, 401, 217-C5 (1991)
- ### RADIO SOURCES: 21 CM RADIATION
- Warm Neutral Halos around Molecular Clouds. III. Interpretation of H I and CO  $J = 1-0$  Data. *B-G Andersson, Peter G. Wannier, & Mark Morris.* 366, 464, 8-F1 (1991)
- Properties of the Redshift. II. Radial Variation. *W. G. Tifft.* 368, 105, 24-D1 (1991)
- The Shape of the Galaxy. *Leo Blitz & David N. Spergel.* 370, 205, 49-F11 (1991)
- IRAS 23545+6508, a Dissociating Star: Prototype for a New Observational Class? *P. E. Dewdney, R. S. Roger, C. R. Purton, & W. H. McCutcheon.* 370, 243, 50-C1 (1991)
- Interstellar Matter in Early-Type Galaxies. I. The Catalog. *Morton S. Roberts, David E. Hogg, Joel N. Bregman, William R. Forman, & Christine Jones.* 75, 751, 11-F5 (1991)
- The Neutral Hydrogen Distribution of NGC 3079. *Judith A. Irwin & E. R. Seaquist.* 371, 111, 61-D9 (1991)

- Warm Neutral Halos around Molecular Clouds. II. H I and CO ( $J = 1-0$ ) Observations. *Peter G. Wannier, B-G Andersson, Mark Morris, & Steven M. Lichten*. 75, 987, 16-B1 (1991)
- VLA Observations of 21 Centimeter H I Absorption toward Cassiopeia A. *John H. Bieging, W. Miller Goss, & Eric M. Wilcots*. 75, 999, 16-F5 (1991)
- The Distribution and Kinematics of Neutral Gas in M31. *Robert Braun*. 372, 54, 74-F6 (1991)
- On the Population of H I Dwarf Galaxies. *David H. Weinberg, Arpad Szomoru, P. Guhathakurta, & J. H. van Gorkom*. 372, L13, 79-B11 (1991)
- H I Mapping of Galaxies in the Cluster A1367. *John M. Dickey & Giuseppe Gavazzi*. 373, 347, 92-C12 (1991)
- H I Deficiency in Cluster Spiral Galaxies: Dependence on Galaxy Size. *Monica Valluri & Chanda J. Jog*. 374, 103, 99-C7 (1991)
- Observation of Neutral Hydrogen in the Globular Cluster NGC 2808. *D. J. Faulkner, Tania R. Scott, P. R. Wood, & Alan E. Wright*. 374, L45, 110-C6 (1991)
- The Distance to the Coma Cluster Using the B-Band Tully-Fisher Relation. *M. Fukugita, S. Okamura, K. Tarusawa, H. J. Rood, & B. A. Williams*. 376, 8, 125-B9 (1991)
- Neutral Hydrogen in the Outer Galaxy. *Athanassios Diplas & Blair D. Savage*. 377, 126, 139-E5 (1991)
- A Search for Redshifted Neutral Hydrogen from Protoclusters of Galaxies. *Juan M. Uson, Durgadas S. Bagri, & Timothy J. Cornwell*. 377, L65, 150-B1 (1991)
- H I Studies of the Sculptor Group Galaxies. VII. Implications on the Distribution and Nature of Dark Matter in Groups. *Daniel Puche & Claude Carignan*. 378, 487, 158-E1 (1991)
- The H I Content of the Local Group Dwarf (Spheroidal or Irregular?) Galaxy Phoenix. *Claude Carignan, Serge Demers, & Stéphanie Côté*. 381, L13, 194-C1 (1991)
- H I Absorption Measurements toward 15 Pulsars and the Radial Distribution of Diffuse Ionized Gas in the Galaxy. *D. A. Frail, J. M. Cordes, T. H. Hankins, & J. M. Weisberg*. 382, 168, 202-C10 (1991)
- Vertical Distribution and Support of Galactic H I. *Felix J. Lockman & Curtis S. Gehman*. 382, 182, 202-D12 (1991)
- A Survey of H I 21 Centimeter Emission Lines toward Supernova Remnants. *Bon-Chul Koo & Carl Heiles*. 382, 204, 202-F11 (1991)
- Neutral Hydrogen Observations of Galaxies in Superclusters. *M. P. Haynes & R. Giovanelli*. 77, 331, 49-B1 (1991)
- Properties of the Redshift. III. Temporal Variation. *W. G. Tifft*. 382, 396, 206-E1 (1991)
- The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. I. Southern Clusters. *J. R. Mould, L. Staveley-Smith, R. A. Schommer, G. D. Bothun, P. J. Hall, Ming Sheng Han, J. P. Huchra, J. Roth, W. Walsh, & A. E. Wright*. 383, 467, 220-B7 (1991)
- RADIO SOURCES: VARIABLE**
- Correlated Radio and Optical Variability in the BL Lacertae Object 0716+714. *A. Quirrenbach, A. Witzel, S. Wagner, F. Sanchez-Pons, T. P. Krichbaum, R. Wegner, K. Anton, U. Erkens, M. Haehnelt, J. A. Zensus, & K. J. Johnston*. 372, L71, 85-C9 (1991)
- Variability of Interstellar Hydroxyl Masers. *Andrew W. Clegg & James M. Cordes*. 374, 150, 99-G11 (1991)
- A Model for the Spectral Variability of BL Lacertae Objects at High Frequencies. *A. Celotti, L. Maraschi, & A. Treves*. 377, 403, 144-G1 (1991)
- Coherent Radiation from Energetic Electron Streams via Collisionless Bremsstrahlung in Strong Plasma Turbulence. *James C. Weatherall & Gregory Benford*. 378, 543, 159-B8 (1991)
- Daily Observations of Compact Radio Sources at 2.7 and 8.1 GHz: 1979-1987. *E. B. Waltman, R. L. Fiedler, K. J. Johnston, J. H. Spencer, D. R. Florkowski, F. J. Josties, D. D. McCarthy, & D. N. Matsakis*. 77, 379, 49-G5 (1991)
- Multifrequency Observations of BL Lacertae in 1988. *N. Kawai, M. Matsuoka, J. N. Bregman, H. D. Aller, M. F. Aller, P. A. Hughes, S. A. Balbus, T. J. Balonek, K. C. Chambers, R. E. S. Clegg, S. D. Clements, R. J. Leacock, A. G. Smith, R. Goodrich, J. S. Miller, M. Hereld, M. G. Hoare, V. A. Hughes, G. K. Miley, G. H. Moriarty-Schieven, K. Matthews, G. Neugebauer, T. Ohashi, P. F. Roche, H. A. Thronson, E. Valtaoja, H. Terasranta, J. R. Webb, B. J. Wills, & D. Wills*. 382, 508, 207-G8 (1991)
- Time-dependent Radio Sources in the Star-forming Region Cepheus A (East). *V. A. Hughes*. 383, 280, 215-F1 (1991)
- X-Ray and Radio Pulse Phase Comparison for PSR 1509-58. *N. Kawai, R. Okayasu, W. Brinkmann, R. Manchester, A. G. Lyne, & N. D'Amico*. 383, L65, 226-D12 (1991)
- RELATIVITY**
- On the Orbital Period Change of the Binary Pulsar PSR 1913+16. *Thibault Damour & J. H. Taylor*. 366, 501, 9-C1 (1991)
- Application of a General Relativistic Accretion Disk Model to LMC X-1, LMC X-3, X1608-522, and X1636-536. *Ken Ebisawa, Kazuhisa Mitsuda, & Tomoyuki Hanawa*. 367, 213, 14-F8 (1991)
- Olbers's Paradox and the Spectral Intensity of the Extragalactic Background Light. *Paul S. Wesson*. 367, 399, 18-D5 (1991)
- Numerical Study of a Perturbed Einstein-de Sitter Cosmological Model. *H. V. Fagundes & S. F. Kwok*. 368, 337, 29-C4 (1991)
- The Appearance of Highly Relativistic, Spherically Symmetric Stellar Winds. *Marek A. Abramowicz, Igor D. Novikov, & Bohdan Paczyński*. 369, 175, 38-B5 (1991)
- A Relativistic Model of Pulsar Polarization. *M. Blaskiewicz, J. M. Cordes, & I. Wasserman*. 370, 643, 56-D9 (1991)
- Stability of Collapsed Star in Bimetric General Relativity. II. *Amos Harpaz & Nathan Rosen*. 371, 254, 63-C9 (1991)
- The Relativistic Rotation Transformation and the Corotating Source Model. *S. Kichenassamy & R. A. Krikorian*. 371, 277, 63-E7 (1991)
- Near-critical Spherical Accretion by Neutron Stars: General Relativistic Treatment. *Myeong-Gu Park & Guy S. Miller*. 371, 708, 70-D1 (1991)
- High-Precision Timing of Millisecond Pulsars. I. Astrometry and Masses of the PSR 1855+09 System. *M. F. Ryba & J. H. Taylor*. 371, 739, 70-F9 (1991)
- Numerical Solution of the General Relativistic Boltzmann Equation for Massive and Massless Particles. *Hugh Harleston & Katherine A. Holcomb*. 372, 225, 76-F13 (1991)
- Coincidence Probabilities for Spacecraft Gravitational Wave Experiments: Massive Coalescing Binaries. *Massimo Tinto & J. W. Armstrong*. 372, 545, 82-E1 (1991)
- Hard X-Ray Spectra from Gap Accretion onto Neutron Stars. *Włodzimierz Kluźniak & James R. Wilson*. 372, L87, 85-E1 (1991)
- Relativistic Motion in Gamma-Ray Bursts. *Julian H. Krolik & Edward A. Pier*. 373, 277, 89-D8 (1991)
- Structure and Stability of Rotating Relativistic Neutron Stars. *F. Weber, N. K. Glendenning & M. K. Weigel*. 373, 579, 95-B10 (1991)
- Voyager 2 Test of the Radar Time-Delay Effect. *Timothy P. Krisher, John D. Anderson, & Anthony H. Taylor*. 373, 665, 96-C1 (1991)
- Post-Newtonian Effects on the Modes of Rotating Stars. *Curt Cutler*. 374, 248, 101-C1 (1991)
- Cyclotron Resonant Scattering and Absorption. *Alice K. Harding & Joseph K. Daugherty*. 374, 687, 107-E8 (1991)
- Gamma-Ray Bursts from Colliding Strange Stars. *P. Haensel, B. Paczyński, & P. Amsterdamski*. 375, 209, 113-E10 (1991)
- Perturbations of the Robertson-Walker Space: Multicomponent Sources and Generalized Gravity. *Jai-chan Hwang*. 375, 443, 118-C7 (1991)
- Perturbations in a Singularity-free Cosmological Model. *Mark Israelit & Nathan Rosen*. 375, 463, 118-E1 (1991)
- The Evolution of Discontinuities in Radiating Spheres in the Diffusion Approximation. *W. Barreto, L. Herrera, & L. Núñez*. 375, 663, 121-A1 (1991)
- The Effects of Thermal Radiation on Some General Relativistic Stellar Models. *J. M. Aguirregabiria, J. Ibáñez, A. Di Prisco, & L. Herrera*. 376, 662, 134-E8 (1991)
- Solar Gravitational Redshift from the Infrared Oxygen Triplet. *James C. LoPresto, Charles Schrader, & A. Keith Pierce*. 376, 757, 135-F1 (1991)
- A New Approach to Gravitational Microlensing: Time Delays and the Galactic Mass Distribution. *Lawrence M. Krauss & Todd A. Small*. 378, 22, 151-C8 (1991)
- A Determination of Relativistic Shock Jump Conditions Using Monte Carlo Techniques. *Donald C. Ellison & Stephen P. Reynolds*. 378, 214, 153-F1 (1991)
- The Contribution of Light Bending and Redshift to the Pulse Characteristics of a Pulsar in the Case of Smaller Neutron Stars. *R. C. Kapoor*. 378, 227, 153-G1 (1991)

- Cosmological Constraints on the Zero-Point Electromagnetic Field.** *Paul S. Wesson.* 378, 466, 158-C1 (1991)
- Polarization Properties of Emission Lines from Relativistic Accretion Disks.** *Kaiyou Chen & Douglas M. Eardley.* 382, 125, 201-F10 (1991)
- Gravitational Effects of Light Scalar Particles.** *Thomas Helbig.* 382, 223, 203-A7 (1991)
- Diffusion Processes in the Collapse of a Radiating Spherical Body.** *R. Chan, L. Herrera, J. A. F. Pacheco, & N. O. Santos.* 382, 255, 203-D1 (1991)
- Gauge-invariant Joining Conditions for Cosmological Perturbations.** *Jai-chan Hwang & Ethan T. Vishniac.* 382, 363, 206-B1 (1991)
- Physically Permitted Cosmological Models with Nonzero Cosmological Constant.** *M. Moles.* 382, 369, 206-B9 (1991)
- Testing Einstein's Theory of Gravity by Analyzing Lunar Laser Ranging Data.** *J. Müller, M. Schneider, M. Soffel, & H. Ruder.* 382, L101, 211-E12 (1991)
- Hubble Spheres and Particle Horizons.** *Edward Harrison.* 383, 60, 212-G1 (1991)
- Spherical Accretion onto Black Holes: A Complete Analysis of Stationary Solutions.** *Luciano Nobili, Roberto Turolla, & Luca Zampieri.* 383, 250, 215-C9 (1991)
- ROTATION**
- Nonaxisymmetric Instabilities in Rotating Shear Flows: Internal Gravity Modes in Stratified Media and Analogies with Plane Flows.** *P. Ghosh & M. A. Abramowicz.* 366, 221, 3-F13 (1991)
- SHOCK WAVES**
- Nonthermal X-Ray Emission from Winds of OB Supergiants.** *Wan Chen & Richard L. White.* 366, 512, 9-D1 (1991)
- Oblique Mixed Shocks in Extragalactic Jets.** *D. Fraix-Burnet & G. Pelletier.* 367, 86, 13-B1 (1991)
- Instabilities and Clumping in SN 1987A. I. Early Evolution in Two Dimensions.** *Bruce Fryxell, Ewald Müller, & David Arnett.* 367, 619, 21-A5 (1991)
- The Dynamic Instability of Adiabatic Blast Waves.** *Dongsu Ryu & Ethan T. Vishniac.* 368, 411, 30-B12 (1991)
- The Effect of Viscosity on Steady Transonic Flow with a Nodal Solution Topology.** *S. P. Owocki & G. P. Zank.* 368, 491, 31-C1 (1991)
- Bow Shock Models of Ultracompact H II Regions.** *Mordacai-Mark Mac Low, Dave Van Buren, Douglas O. S. Wood, & Ed Churchwell.* 369, 395, 42-F1 (1991)
- Narrow-Band Imaging of the Inner R Aquarii Nebula: Further Evidence for Shock Excitation.** *Denis Burgarella & Francesco Paresce.* 370, 590, 55-G1 (1991)
- Shock Waves and Nucleosynthesis in Type II Supernovae.** *M. B. Aufderheide, E. Baron, & F.-K. Thielemann.* 370, 630, 56-C8 (1991)
- Near-Infrared Emission-Line Images of Three Herbig-Haro Objects.** *Karl R. Stapelfeldt, Charles A. Beichman, J. Jeff Hester, Nicholas Z. Scoville, & Thomas N. Gautier III.* 371, 226, 63-A1 (1991)
- The Shock Process and Light-Element Production in Supernova Envelopes.** *Lawrence E. Brown, David S. Dearborn, David N. Schramm, Jon T. Larsen, & Shin Kurokawa.* 371, 648, 69-F1 (1991)
- Supernova Remnant 1987A.** *Ding Luo & Richard McCray.* 372, 194, 76-D1 (1991)
- The H<sub>2</sub> Line Profiles in the Cygnus Loop: Evidence for J-Shocks with Magnetic Precursors.** *James R. Graham, Gillian S. Wright, & T. R. Geballe.* 372, L21, 79-C7 (1991)
- Atmospheric Gradients and the Stability of Expanding Jets.** *Philip E. Hardee, Michael L. Norman, Theodoros Kouvelis, & David A. Clarke.* 373, 8, 86-B10 (1991)
- W28 and 3C 400.2: Two Shell-like Radio Supernova Remnants with Centrally Peaked X-Ray Morphologies.** *Knox S. Long, William P. Blair, Richard L. White, & Yutaka Matsui.* 373, 567, 95-A10 (1991)
- Solar Particle Abundances at Energies Greater than 1 MeV per Nucleon and the Role of Interplanetary Shocks.** *H. V. Cane, D. V. Reames, & T. T. von Rosenvinge.* 373, 675, 96-D1 (1991)
- The Hydrodynamics of Relict Cosmological H II Regions and the Formation of Objects at High Redshift.** *Piero Madau & Avery Meiksin.* 374, 6, 98-B7 (1991)
- Synchrotron Emission from Shocked Relativistic Jets. III. Models for the Centimeter Wave Band Quiescent and Burst Emission from**
- 3C 279 and OT 081.** *P. A. Hughes, H. D. Aller, & M. F. Aller.* 374, 57, 98-F5 (1991)
- Far-Ultraviolet Mapping of the Cygnus Loop with the Voyager 2 Ultraviolet Spectrometer.** *William P. Blair, Knox S. Long, Olaf Vancura, & J. B. Holberg.* 374, 202, 100-E5 (1991)
- Observations of [Si II] (35 Micron) and [S I] (25 Micron) in Orion: Evidence for a Wind Shock near IRc2.** *Michael R. Haas, David Hollenbach, & Edwin F. Erickson.* 374, 555, 106-B1 (1991)
- Expansion of a Superbubble in a Uniform Magnetic Field.** *Katia M. Ferrière, Mordacai-Mark Mac Low, & Ellen G. Zweibel.* 375, 239, 114-A4 (1991)
- Siphon Flows in Isolated Magnetic Flux Tubes. IV. Critical Flows with Standing Tube Shocks.** *John H. Thomas & Benjamin Montesinos.* 375, 404, 115-G1 (1991)
- Noise-driven Radiative Shocks: A New Model for the Optical Quasi-periodic Oscillations of the AM Herculis Objects.** *Michael T. Wolff, Kent S. Wood, & James N. Imamura.* 375, L31, 117-D6 (1991)
- Probing Shock Models of CH<sup>+</sup> Formation.** *Isabel Hawkins & Nahide Craig.* 375, 642, 120-F1 (1991)
- Six Balmer-dominated Supernova Remnants.** *R. Chris Smith, Robert P. Kirshner, William P. Blair, & P. Frank Winkler.* 375, 652, 120-G1 (1991)
- The Evolution of Discontinuities in Radiating Spheres in the Diffusion Approximation.** *W. Barreto, L. Herrera, & L. Núñez.* 375, 663, 121-A1 (1991)
- Proto-Planetary Nebulae. II. The Shock-heated Bipolar Nebulae GL 618 and M2-56.** *Robert W. Goodrich.* 376, 654, 134-D12 (1991)
- Neutrino-Nucleus Interactions in Core-Collapse Supernovae.** *Stephen W. Bruenn & W. C. Haxton.* 376, 678, 134-G1 (1991)
- The Interaction of Collisionless Shocks in Astrophysical Plasmas.** *P. J. Cargill.* 376, 771, 136-A1 (1991)
- Parametric Study of the Formation of Magnetohydrodynamic Shocks. I. Model.** *Y. C. Whang.* 377, 250, 141-B1 (1991)
- Parametric Study of the Formation of Magnetohydrodynamic Shocks. II. Slow Shocks.** *Y. C. Whang.* 377, 255, 141-B7 (1991)
- Partially Dissociative Jump Shocks in Molecular Hydrogen.** *C. A. Chang & P. G. Martin.* 378, 202, 153-E1 (1991)
- A Determination of Relativistic Shock Jump Conditions Using Monte Carlo Techniques.** *Donald C. Ellison & Stephen P. Reynolds.* 378, 214, 153-F1 (1991)
- The Optical Emission from Oscillating White Dwarf Radiative Shock Waves.** *James N. Imamura, Hussain Rashed, & Michael T. Wolff.* 378, 665, 160-F5 (1991)
- Solar Gamma-Ray-Line Flares, Type II Radio Bursts, and Coronal Mass Ejections.** *E. W. Cliver, H. V. Cane, D. J. Forrest, M. J. Koomen, R. A. Howard, & C. S. Wright.* 379, 741, 174-A2 (1991)
- On the Distribution of the Diffuse Galactic Gamma-Ray Line Emissions at 1809 keV and 511 keV.** *P. von Ballmoos.* 380, 98, 177-C1 (1991)
- Predicted Extreme-Ultraviolet Line Emission for Nearby Main-Sequence B Stars.** *J. J. MacFarlane, J. P. Cassinelli, B. Y. Welsh, P. W. Vedder, J. V. Vallerga, & W. L. Waldron.* 380, 564, 185-C1 (1991)
- Outflow Hydrodynamics in the Eclipsing Millisecond Pulsar Binaries PSR 1957+20 and PSR 1744-24A.** *Marco Tavani & Leigh Brookshaw.* 381, L21, 194-C13 (1991)
- Parametric Study of the Formation of Magnetohydrodynamic Shocks. III. Fast and Slow Shocks.** *Y. C. Whang.* 381, 559, 197-E10 (1991)
- Electron Acceleration in a Nonlinear Shock Model with Applications to Supernova Remnants.** *Donald C. Ellison & Stephen P. Reynolds.* 382, 242, 203-C1 (1991)
- Molecular Line Emission Models of Herbig-Haro Objects. I. H<sub>2</sub> Emission.** *Mark G. Wolfire & Achim König.* 383, 205, 214-E9 (1991)
- Evidence for a Thermally Unstable Shock Wave in the Vela Supernova Remnant.** *John C. Raymond, George Wallerstein, & Bruce Balick.* 383, 226, 214-G5 (1991)
- Magnetized Supernova Remnants with Cosmic Rays.** *Katia M. Ferrière & Ellen G. Zweibel.* 383, 602, 221-F11 (1991)
- Supernova Remnants in Dense Clouds. I. Blast-Wave Dynamics and X-Ray Irradiation.** *B. T. Draine & D. T. Woods.* 383, 621, 222-A6 (1991)

**SKY PHOTOGRAPHS**

The Imaging Performance of the *Hubble Space Telescope*. Christopher J. Burrows, Jon A. Holtzman, S. M. Faber, Pierre Y. Bely, Hashima Hasan, C. R. Lynds, & Daniel Schroeder. 369, L21, 45-C1 (1991)

**SOLAR SYSTEM: GENERAL**

Gravitational Diffusion of Solar System WIMPs. Andrew Gould. 368, 610, 32-F7 (1991)

<sup>26</sup>Al and <sup>16</sup>O in the Early Solar System: Clues from Meteoritic Al<sub>2</sub>O<sub>3</sub>. Edward Anders, Alois Virág, Ernst Zinner, & Roy S. Lewis. 373, L77, 97-F6 (1991)

The Dynamical Evolution of the Protosolar Nebula. Steven P. Ruden & James B. Pollack. 375, 740, 121-G11 (1991)

Testing Einstein's Theory of Gravity by Analyzing Lunar Laser Ranging Data. J. Müller, M. Schneider, M. Soffel, & H. Ruder. 382, L101, 211-E12 (1991)

**SPECTROPHOTOMETRY**

Southern *IRAS* Quasars with Extreme Fe II Emission. S. Lipari, F. D. Macchetto, & D. Golombek. 366, L65, 11-C1 (1991)

ESO 207-61: A Brown Dwarf Candidate in the Hyades Moving Group. María Teresa Ruiz, Marianne Y. Takamiya, & Miguel Roth. 367, L59, 22-C7 (1991)

Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. II. An Intensive Study of NGC 5548 at Optical Wavelengths. B. M. Peterson, T. J. Balonek, E. S. Barker, J. Bechtold, R. Bertram, N. G. Bochkarev, M. J. Bolte, D. Bond, T. A. Boroson, M. T. Carini, T. E. Carone, J. A. Christensen, S. D. Clements, A. L. Cochran, R. D. Cohen, D. Crampton, M. Dietrich, M. Elvis, A. Ferguson, A. V. Filippenko, K. J. Fricke, C. M. Gaskell, J. P. Halpern, J. P. Huchra, J. B. Hutchings, W. Kollatschny, A. P. Koratkar, K. T. Korista, J. H. Krolik, N. J. Lane, A. Laor, R. J. Leacock, G. M. MacAlpine, M. A. Malkan, D. Maoz, H. R. Miller, S. L. Morris, H. Netzer, C. L. M. Oliveira, J. Penfold, M. V. Penston, E. Pérez, R. W. Pogge, M. W. Richmond, W. Romanishin, E. I. Rosenblatt, L. Saddlemeyer, A. Sadun, S. R. Sawyer, J. C. Shields, A. I. Shapovalova, A. G. Smith, H. A. Smith, P. S. Smith, W.-H. Sun, U. Thiele, T. J. Turner, S. Veilleux, R. M. Wagner, R. J. Weymann, B. J. Wilkes, B. J. Wills, D. Wills, & P. F. Younger. 368, 119, 24-E3 (1991)

A Spectrophotometric Atlas of White Dwarfs Compiled from the *IUE* Archives. Gary Wegner & Steven R. Swanson. 75, 507, 7-E13 (1991)

Young Stellar Objects Detected by *IRAS*. Frank O. Clark. 75, 611, 9-B5 (1991)

The Shape of the Ultraviolet Continuum of Quasars and Intergalactic Dust. F. H. Cheng, C. Martin Gaskell, & Anuradha P. Koratkar. 370, 487, 54-D9 (1991)

The Origin of the Far-Infrared Continuum in Active Galactic Nuclei. L. K. Hunt. 370, 511, 54-F9 (1991)

The Ultraviolet Continuum and the Fluorescent H<sub>2</sub> Lines in Low-Excitation Herbig-Haro Objects. K.-H. Böhm, D. M. Scott, & J. Sofz. 371, 248, 63-C1 (1991)

Ultramassive ( $\sim 10^{11} M_{\odot}$ ) Dark Core in the Luminous Infrared Galaxy NGC 6240? Jonathan Bland-Hawthorn, Andrew S. Wilson, & R. Brent Tully. 371, L19, 66-C7 (1991)

The Ultraviolet Spectrum and Continuum Energy Distribution of the Bright Quasar H1821+643. Michiel Kolman, Jules P. Halpern, Chris R. Shrader, & Alexei V. Filippenko. 373, 57, 86-F8 (1991)

The Bumps in the Spectral Energy Distribution of Active Galactic Nuclei. Marcella Contini & Sueli M. Viegas. 373, 405, 93-A9 (1991)

Imaging Spectrophotometry of Ionized Gas in NGC 1068. II. Global Ionization of the Inner Disk. Jonathan Bland-Hawthorn, James Sokolowski, & Gerald Cecil. 375, 78, 112-A1 (1991)

*IUE* Observations of Early-type Stars at High Galactic Latitudes. D. A. Quin, P. J. F. Brown, E. S. Conlon, P. L. Dufton, & F. P. Keenan. 375, 342, 115-B7 (1991)

Imaging Spectrophotometry of Ionized Gas in NGC 1068. III. Anisotropic Excitation of the Large-Scale Disk by Scattering of Nuclear Continuum. James Sokolowski, Jonathan Bland-Hawthorn, & Gerald Cecil. 375, 583, 120-A1 (1991)

Absolute Far-Ultraviolet Spectrophotometry of Hot Subluminous Stars from *Voyager*. J. B. Holberg, B. Ali, T. E. Carone, & R. S. Polidan. 375, 716, 121-E11 (1991)

**The Featureless Continua and Hydrogen Lines of Seyfert 2 Galaxies.**

A. L. Kinney, R. R. J. Antonucci, M. J. Ward, A. S. Wilson, & M. Whittle. 377, 100, 139-C5 (1991)

**Narrow-Band Photometry and the Evolution of Galaxies. III.**

The Intermediate-Redshift Sample. Karl D. Rakos, James M. Schombert, & Tobias J. Kreidl. 377, 382, 144-E7 (1991)

**Multidirectional Views of the Active Nucleus of NGC 1068. J. S. Miller,**

R. W. Goodrich, & William G. Mathews. 378, 47, 151-E13 (1991)

**Galactic Bulge M Giants. IV. 0.5–2.5 Micron Spectrophotometry and**

Abundances for Stars in Baade's Window. D. M. Terndrup, Jay A. Frogel, & A. E. Whitford. 378, 742, 161-E5 (1991)

**Search for Starbursts among X-Ray-selected Galaxies: Optical Spectroscopy.** Antonella Fruscione & Richard E. Griffiths. 380, L13, 181-C1 (1991)
**The Discovery of a Young Radio Galaxy at  $z = 2.390$ : Probing Initial Star Formation at  $z \lesssim 3.0$ .** Roger A. Windhorst, David Burstein,

Doug F. Mathis, Lyman W. Neuschaefer, F. Bertola, L. M. Buson, David C. Koo, Keith Matthews, Peter D. Barthel, & K. C. Chambers. 380, 362, 182-G1 (1991)

**Catalog of SN 1987A Polarimetry Corrected for Interstellar Polarization.** David J. Jeffery. 77, 405, 50-B5 (1991)
**Emission-Line and Continuum Properties of 92 Bright QSOs: Luminosity Dependence and Differences between Radio-selected and Optically Selected Samples.** Charles C. Steidel & Wallace L. W. Sargent. 382, 433, 207-A1 (1991)
**Asymptotic Theory for the Spatial Distribution of Protostellar Emission.** Fred C. Adams. 382, 544, 208-C8 (1991)
**Far-Infrared and Submillimeter Wavelength Observations of Star-forming Dense Cores. II. Images.** E. F. Ladd, Fred C. Adams, S. Casey, J. A. Davidson, G. A. Fuller, D. A. Harper, P. C. Myers, & R. Padman. 382, 555, 208-D7 (1991)
**Optical Excess Emission in T Tauri Stars.** Patrick Hartigan, Scott J. Kenyon, Lee Hartmann, Stephen E. Strom, Suzan Edwards, Alan D. Weitz, & John Stauffer. 382, 617, 209-C1 (1991)
**Near-Infrared [Fe II] Emission of M82 Supernova Remnants:**

Implications for Tracing the Supernova Content of Galaxies. Matthew A. Greenhouse, Charles E. Woodward, Harley A. Thronson, Jr., Richard J. Rudy, George S. Rossano, Peter Erwin, & R. C. Puett. 383, 164, 214-B1 (1991)

**On the Near-Infrared Spectrum of FU Orionis.** Nuria Calvet, Lee Hartmann, & Scott J. Kenyon. 383, 752, 223-E6 (1991)
**An Interactive Companion to the S Star HD 35155.** Thomas B. Ake III, Hollis R. Johnson, & Mudhaffer M. Ameen. 383, 842, 224-F7 (1991)
**STARS: ABUNDANCES****Application of Oxygen-enhanced Evolutionary Sequences to the Horizontal Branch of M15.** Ben Dorman, Young-Wook Lee, & Don A. VandenBerg. 366, 115, 2-D11 (1991)
**On the [O/Fe] versus [Fe/H] Relationship and the Progenitors of Type I Supernovae.** C. Abia, R. Canal, & J. Isern. 366, 198, 3-E1 (1991)
**Evidence for CNO Processed Material in the Accretion Disk of GP Comae.** T. R. Marsh, Keith Horne, & Simon Rosen. 366, 535, 9-F1 (1991)
**A Crucial Test of the Diffusion Model: 53 Camelopardalis.** J. Babel & G. Michaud. 366, 560, 10-A5 (1991)
**s-Process Nucleosynthesis in Massive Stars and the Weak Component.**

I. Evolution and Neutron Captures in a  $25 M_{\odot}$  Star. C. M. Raiteri, M. Bussò, R. Gallino, G. Picchio, & L. Pulone. 367, 228, 14-G13 (1991)

**PW Vulpeculae: A Nova with Nearly Solar Abundances.** Pedro Saizar,

Summer Starrfield, Gary J. Ferland, R. Mark Wagner, James W. Truran, Scott J. Kenyon, Warren M. Sparks, Robert E. Williams, & L. L. Stryker. 367, 310, 15-G11 (1991)

**Abundances in the Red Giants of M13 and M22.** M. D. Lehnert, R. A. Bell, & J. G. Cohen. 367, 514, 19-F9 (1991)
**Metal Abundances of RR Lyrae Variables in Selected Galactic Star Fields. V. The Lick Astrographic Fields at Intermediate Galactic Latitudes.** Nicholas B. Suntzeff, T. D. Kinman, & Robert P. Kraft. 367, 528, 19-G13 (1991)
**Chemical Abundances for Cyanogen-weak Giants.** R. Earle Luck. 75, 579, 8-F11 (1991)
**The Response of Main-Sequence Stars within a Common Envelope.**

Michael S. Hjellming & Ronald E. Taam. 370, 709, 57-C1 (1991)

- Lithium in the Most Extreme Halo Stars; Trends with Metallicity. *Constantine P. Deliyannis & Pierre Demarque*. 370, L89, 59-E5 (1991)
- Lithium, Age, and Metallicity in Open Clusters. *Ann Merchant Boesgaard*. 370, L95, 59-E12 (1991)
- Echelle Spectroscopy of CD -41° 13967: The Young Central Star of a New Planetary Nebula. *James K. McCarthy, R. Michael Rich, S. R. Becker, K. Butler, D. Husfeld, & H. G. Groth*. 371, 380, 64-G1 (1991)
- Carbon Isotope Ratios along the Giant Branch of M67. *Kalpana Krishnarawamy Gilroy & Jeffery A. Brown*. 371, 578, 68-F7 (1991)
- Diffusion and Mixing of Lithium and Helium in Population II Dwarfs. *Charles R. Proffitt & Georges Michaud*. 371, 584, 68-G1 (1991)
- s-Process Nucleosynthesis in Massive Stars and the Weak Component. II. Carbon Burning and Galactic Enrichment. *C. M. Raiteri, M. Busso, R. Gallino, & G. Picchio*. 371, 665, 69-G6 (1991)
- How Much Hydrogen Is There in a White Dwarf? *James McDonald & Stéphane Vennes*. 371, 719, 70-E1 (1991)
- Multicolor CCD Photometry of Globular Clusters in Two Virgo Elliptical Galaxies. *Jean Couture, William E. Harris, & J. W. B. Allwright*. 372, 97, 75-C1 (1991)
- A Simple Accretion/Diffusion Model for λ Bootis Stars. *Paul Charbonneau*. 372, L33, 79-D13 (1991)
- Non-LTE Analysis of the Ofpe/WN9 Star HDE 269227 (R84). *Werner Schmutz, Claus Leitherer, Ivan Hubeny, Manfred Vogel, Wolf-Rainer Hamann, & Ulf Wesselowski*. 372, 664, 84-A1 (1991)
- Photoerosion and the Abundances of  $^7\text{Li}$ ,  $^9\text{Be}$ ,  $^{10}\text{B}$ , and  $^{11}\text{B}$  near Active Galactic Nuclei. *R. N. Boyd & H. S. Fencl*. 373, 84, 87-A13 (1991)
- Si IV and C IV Resonance Lines as Indicators of Massive Stars in Starburst Galaxies. *Claus Leitherer & Henny J. G. L. M. Lamers*. 373, 89, 87-B6 (1991)
- The Lithium Abundance of M67 Blue Stragglers: A Constraint on the Blue Straggler Phenomenon. *C. J. Pritchett & J. W. Glazey*. 373, 105, 87-C12 (1991)
- The Lithium Abundance of the T Tauri Star BP Tauri. *Douglas K. Duncan*. 373, 250, 89-B1 (1991)
- Single and Binary Star Evolution. *Icko Iben, Jr.* 76, 55, 24-G3 (1991)
- C and N Abundances among 47 Tucanae Main-Sequence Stars. *Michael M. Briley, James E. Hesser, & R. A. Bell*. 373, 482, 94-A1 (1991)
- An Extreme Population II Dwarf without Lithium. *L. M. Hobbs, D. E. Wely, & J. A. Thorburn*. 373, L47, 97-B13 (1991)
- Isochrones for H-burning Globular Cluster Stars. II. The Metallicity Range  $-2.3 < [\text{Fe}/\text{H}] < -0.5$ . *Oscar Straniero & Alessandro Chieffi*. 76, 525, 32-D1 (1991)
- A Critical Appraisal of Published Values of [Fe/H] for K II-IV Stars. *Benjamin J. Taylor*. 76, 715, 34-E12 (1991)
- The Lithium Abundance in Extreme Halo Stars. *L. M. Hobbs & J. A. Thorburn*. 375, 116, 112-D8 (1991)
- Diffusion and Mixing in Classical Nova Precursors. *Icko Iben, Jr., Masayuki Y. Fujimoto, & Jim MacDonald*. 375, L27, 117-D1 (1991)
- Diameters of Galactic Globular Clusters. *Sidney van den Bergh, Christopher Morley, & John Pazder*. 375, 594, 120-B1 (1991)
- On the Formation of Globular Clusters. I. Dynamical Limits on Globular Cluster Metallicities. *J. H. Brown, A. Burkert, & James W. Truran*. 376, 115, 126-D1 (1991)
- The White Dwarf Mass Distribution in Classical Nova Systems. *Hans Ritter, Michael Politano, Mario Livio, & Ronald F. Webbink*. 376, 177, 127-B10 (1991)
- Inhomogeneous Halo Collapse and Early Galactic Chemical Evolution: Globular Cluster Metallicities. *G. Malinie, D. H. Hartmann, & G. J. Mathews*. 376, 520, 132-G9 (1991)
- Li Depletion in F Stars by Internal Gravity Waves. *Ramón J. García López & Hendrik C. Spruit*. 377, 268, 141-C7 (1991)
- First Results from the Goddard High-Resolution Spectrograph: High-Resolution Observations of the 1942 Å Resonance Line of Hg II in the Chemically Peculiar B Star, x Lupi. *David S. Leckrone, Glenn M. Wahlgren, & Sveneric G. Johansson*. 377, L37, 143-E1 (1991)
- Metallicity and Velocity Distribution of Giants toward the Galactic Poles. *Kavan U. Ratnatunga & Kenneth M. Yoss*. 377, 442, 145-C3 (1991)
- Lithium Abundances in Carbon Stars. *Grant R. Denn, R. Earle Luck, & David L. Lambert*. 377, 657, 147-G5 (1991)
- First Detection of Beryllium in a Very Metal Poor Star: A Test of the Standard Big Bang Model. *Gerard Gilmore, Bengt Edvardsson, & P. E. Nissen*. 378, 17, 151-C1 (1991)
- The Metallicity of RR Lyrae Stars in Baade's Window. *Alistair R. Walker & Donald M. Terndrup*. 378, 119, 152-D13 (1991)
- Galactic Bulge M Giants. IV. 0.5–2.5 Micron Spectrophotometry and Abundances for Stars in Baade's Window. *D. M. Terndrup, Jay A. Frogel, & A. E. Whitford*. 378, 742, 161-E5 (1991)
- Extragalactic Globular Clusters. III. Metallicity Comparisons and Anomalies. *Jean P. Brodie & John P. Huchra*. 379, 157, 165-A1 (1991)
- Lithium in Halo Stars: Constraining the Effects of Helium Diffusion on Globular Cluster Ages and Cosmology. *Constantine P. Deliyannis & Pierre Demarque*. 379, 216, 165-F7 (1991)
- On the Sodium Excess in the Atmospheres of Yellow Supergiants. *N. Prantzos, A. Coc, & J. P. Thibaud*. 379, 729, 173-G1 (1991)
- The Stellar Content and Structure of the Globular Cluster NGC 5053. *Gregory G. Faherty, Harvey B. Richer, & James Nemec*. 380, 124, 177-E11 (1991)
- Three Newly Recognized Dwarf Carbon Stars. *Paul J. Green, Bruce Margon, & D. Jack MacConnell*. 380, L31, 181-E1 (1991)
- The Galactic Globular Cluster System: Theoretical Constraints for  $\alpha$ -enhanced Compositions. *D. Bencivelli, F. Caputo, M. Manteiga, & M. L. Quarta*. 380, 484, 184-C1 (1991)
- Abundances in Red Giant Stars: Nitrogen Isotopes in Carbon-rich Molecular Envelopes. *P. G. Wannier, B.-G. Andersson, H. Olofsson, N. Ukita, & K. Young*. 380, 593, 185-E8 (1991)
- A Non-Local Thermodynamic Equilibrium, Line-blanketed Synthetic Spectrum of Iota Herculis: C, Al, and Si Lines. *James A. Grigsby*. 380, 606, 185-F9 (1991)
- Carbon Isotopic Abundances in Giant Stars in the CN-bimodal Globular Clusters NGC 6752 and M4. *Nicholas B. Suntzeff & Verne V. Smith*. 381, 160, 191-A8 (1991)
- Abundances of Te and Related Elements in Stars of Type M, MS, and S. *Andrew D. Vanture, George Wallerstein, Jeffery A. Brown, & Grant Bazzan*. 381, 278, 192-D7 (1991)
- Advanced Evolutionary Phases of Large-Metallicity Low-Mass Stars and the Problem of the Ultraviolet Excess of Elliptical Galaxies. *Marco Castellani & Amedeo Tornambè*. 381, 393, 195-E9 (1991)
- Metal Opacities and Convective Core Overshooting in Population I Stars. *Richard B. Stothers & Chao-wen Chin*. 381, L67, 199-E7 (1991)
- Wide Binaries in the Woolley Catalog. *Ira Wasserman & Martin D. Weinberg*. 382, 149, 202-A12 (1991)
- CN and HCN in the Infrared Spectrum of IRC +10216. *G. R. Wiedemann, Kenneth H. Hinkle, John J. Keady, D. Deming, & D. E. Jennings*. 382, 321, 204-B10 (1991)
- Metal-rich Giant Branches of Bulge Clusters: Application to Color-Magnitude Diagrams of M31 and M32. *E. Bica, B. Barbuy, & S. Ortolani*. 382, L15, 205-B12 (1991)
- Massive Star Evolution and SN 1987A. *David Arnett*. 383, 295, 215-G8 (1991)
- Effects of Negatively Charged Massive Particles on Primordial Stars. *R. N. Boyd & G. M. Fuller*. 383, 615, 221-G12 (1991)
- About the Stage of Evolution of Wolf-Rayet Stars. *Anne B. Underhill*. 383, 729, 223-C6 (1991)
- Observational Tests of Convective Core Overshooting in Stars of Intermediate to High Mass in the Galaxy. *Richard B. Stothers*. 383, 820, 224-D8 (1991)
- Implications of Helium Diffusion for Globular Cluster Isochrones and Luminosity Functions. *Charles R. Proffitt & Don A. Vandenberg*. 77, 473, 51-C10 (1991)
- Subgiant CH Stars. II. Chemical Compositions and the Evolutionary Connection with Barium Stars. *R. Earle Luck & Howard E. Bond*. 77, 515, 51-G1 (1991)

**STARS: ACCRETION**

- Spectroscopy of FO Aquarii: Evidence for Reprocessing in a Hot Wind. *Phillip J. Martell & Ronald H. Kaitchuck.* 366, 286, 4-E5 (1991)
- Monte Carlo Simulation of Comptonization in Plasma Accreting onto Neutron Stars. *Tomoyuki Hanawa.* 366, 495, 9-B9 (1991)
- Application of a General Relativistic Accretion Disk Model to LMC X-1, LMC X-3, X1608-522, and X1636-536. *Ken Ebisawa, Kazuhisa Mitsuda, & Tomoyuki Hanawa.* 367, 213, 14-F8 (1991)
- Ginga Observation of an AM Herculis Type Source H0538+608. *M. Ishida, A. Silber, H. V. Bradt, R. A. Remillard, K. Makishima, & T. Ohashi.* 367, 270, 15-D6 (1991)
- Interpreting Epsilon Aurigae. *Sean M. Carroll, Edward F. Guinan, George P. McCook, & Robert A. Donahue.* 367, 278, 15-E1 (1991)
- Conditions for Accretion-induced Collapse of White Dwarfs. *Ken'ichi Nomoto & Yoji Kondo.* 367, L19, 17-D1 (1991)
- Accretion Powered Pulsars: Continuum Spectra and Light Curves of Settling Accretion Mounds. *David J. Burnard, Jonathan Arons, & Richard I. Klein.* 367, 575, 20-D10 (1991)
- Dynamic Effects on Cyclotron Scattering in Pulsar Accretion Columns. *J. J. Brainerd & P. Mészáros.* 369, 179, 38-B11 (1991)
- A Search for Periodicities in the X-Ray Emission from Cataclysmic Variables. *Michael Eracleous, Joseph Patterson, & Jules Halpern.* 370, 330, 51-D1 (1991)
- Problems of Ultra-High-Energy Particle Acceleration in Cygnus X-3: A Critical Reappraisal. *Abbas Mirza.* 370, 345, 51-E7 (1991)
- The High State of the FU Orionis Variable Z Canis Majoris. *F. V. Hessman, J. Eisloffel, R. Mundt, L. W. Hartmann, W. Herbst, & J. Krautter.* 370, 384, 52-A10 (1991)
- Disk Accretion onto Magnetic T Tauri Stars. *Arieh Königl.* 370, L39, 53-E13 (1991)
- A Polytropic Model of an Accretion Disk, a Boundary Layer, and a Star. *Bohdan Paczyński.* 370, 597, 55-G11 (1991)
- Does Accretion Cease When a Star Approaches Breakup? *Robert Popham & Ramesh Narayan.* 370, 604, 56-A6 (1991)
- The Response of Main-Sequence Stars within a Common Envelope. *Michael S. Hjellming & Ronald E. Taam.* 370, 709, 57-C1 (1991)
- The Ultraviolet Spectrum of Scorpius X-1 as Observed by IUE: 1978-1988. *T. R. Kallman, J. C. Raymond, & S. D. Vrilek.* 370, 717, 57-C11 (1991)
- The Discovery of an X-Ray Burst and a Study of Aperiodic Variability from SMC X-1. *L. Angelini, L. Stella, & N. E. White.* 371, 332, 64-C1 (1991)
- Accretion in Wind-driven X-Ray Sources. *Ronald E. Taam, Albert Fu, & B. A. Fryxell.* 371, 696, 70-C1 (1991)
- Near-critical Spherical Accretion by Neutron Stars: General Relativistic Treatment. *Myeong-Gu Park & Guy S. Miller.* 371, 708, 70-D1 (1991)
- A Simple Accretion/Diffusion Model for  $\lambda$  Bootis Stars. *Paul Charbonneau.* 372, L33, 79-D13 (1991)
- Magnetic Two-Photon Scattering and Two-Photon Emission: Cross Sections and Redistribution Functions. *S. G. Alexander & P. Mészáros.* 372, 554, 82-E11 (1991)
- Cyclotron Harmonics in Accreting Pulsars and Gamma-Ray Bursters: Effect of Two-Photon Processes. *S. G. Alexander & P. Mészáros.* 372, 565, 82-F9 (1991)
- Nonlinear Evolution of Accretion Disks Induced by Radiative Feedback Processes. *K. R. Bell, D. N. C. Lin, & Steven P. Ruden.* 372, 633, 83-E7 (1991)
- Stationary Accelerators around Keplerian Disks of Aligned Magnetized Collapsed Objects: Pair Production and Gamma-Ray Emission. *K. S. Cheng & M. Ruderman.* 373, 187, 88-C9 (1991)
- High-Energy X-Ray Production in a Boundary Layer of an Accreting Neutron Star. *Tomoyuki Hanawa.* 373, 222, 88-F9 (1991)
- The Near-Infrared Spectra of Low-Mass X-Ray Binaries and Related Objects. *A. P. Cowley, P. C. Schmidke, D. Crampton, J. B. Hutchings, & M. Bolte.* 373, 228, 88-G1 (1991)
- Inefficient Accretion by the DA2 White Dwarf in V471 Tauri. *D. J. Mullan, H. L. Shipman, E. M. Sion, & J. MacDonald.* 374, 707, 107-G8 (1991)
- The Effects of X-Ray Illumination on Accretion Disk Interiors. *Yuan-Kuen Ko & Timothy R. Kallman.* 374, 721, 108-A10 (1991)
- Flux-limited Diffusion in a Scattering Medium. *Fulvio Melia & Gregory J. Zylstra.* 374, 732, 108-B9 (1991)
- Rotation and Emission Lines in Stars and Accretion Disks. *Keith Home & Steven H. Saar.* 374, L55, 110-D6 (1991)
- V1500 Cygni: A Prediction. *J. I. Katz.* 374, L59, 110-D11 (1991)
- Noise-driven Radiative Shocks: A New Model for the Optical Quasi-periodic Oscillations of the AM Herculis Objects. *Michael T. Wolff, Ken S. Wood, & James N. Imamura.* 375, L31, 117-D6 (1991)
- A Powerful Local Shear Instability in Weakly Magnetized Disks. II. Nonlinear Evolution. *John F. Hawley & Steven A. Balbus.* 376, 223, 127-F8 (1991)
- Steady Spherical Hypercritical Accretion onto Neutron Stars. *John C. Houck & Roger A. Chevalier.* 376, 234, 127-G6 (1991)
- The X-Ray Properties of GX 301-2 (4U 1223-62). *F. Haberl.* 376, 245, 128-A5 (1991)
- NGC 1333 IRAS 4: A Very Young, Low-Luminosity Binary System. *Göran Sandell, Colin Aspin, William D. Duncan, Adrian P. G. Russell, & E. Ian Robson.* 376, L17, 130-C1 (1991)
- Isothermal, Compton-heated Coronae above Accretion Disks. *Eve C. Ostriker, Christopher F. McKee, & Richard I. Klein.* 377, 593, 147-B3 (1991)
- Radiative-hydrodynamical Simulations of Accretion Disk Coronae. *Fulvio Melia, Gregory J. Zylstra, & Bruce Fryxell.* 377, L101, 150-E11 (1991)
- Diskoseismology: Probing Accretion Disks. I. Trapped Adiabatic Oscillations. *Michael A. Nowak & Robert V. Wagoner.* 378, 656, 160-E9 (1991)
- The Optical Emission from Oscillating White Dwarf Radiative Shock Waves. *James N. Imamura, Hussain Rashed, & Michael T. Wolff.* 378, 665, 160-F5 (1991)
- Spin Evolution and Magnetic Fields in Cataclysmic Variables. *Andrew R. King & Jean-Pierre Lasota.* 378, 674, 160-G1 (1991)
- A Model for the 35 Day Variations in the Pulse Profile of Hercules X-1. *J. A. Patterson, R. E. Rothschild, & D. E. Gruber.* 378, 696, 161-A11 (1991)
- SN 1988A in M58: Departure from  $^{56}\text{Co}$  Decay 700 Days after Explosion. *P. Ruiz-Lapuente, M. Kidger, G. Gómez, R. Canal, & R. López.* 378, L41, 162-E1 (1991)
- On the Adiabatic Pulsations of Accretion Disks and Rotating Stars. *James R. Ipser & Lee Lindblom.* 379, 285, 166-E7 (1991)
- Very High Energy Gamma-Ray Emission from Accreting X-Ray Pulsars. *K. S. Cheng, K. N. Yu, T. Cheung, & M. M. Lau.* 379, 290, 166-F1 (1991)
- Dynamo Magnetic Field Modes in Thin Astrophysical Disks: An Adiabatic Computational Approximation. *T. F. Stepinski & E. H. Levy.* 379, 343, 167-C9 (1991)
- Magnetically Driven Jets and Winds. *R. V. E. Lovelace, H. L. Berk, & J. Contopoulos.* 379, 696, 173-D1 (1991)
- Does SV Centauri Harbor an Accretion Disk? *Albert P. Linnell & Xania Scheick.* 379, 721, 173-F7 (1991)
- Irradiation of Accretion Disks around Young Objects. I. Near-Infrared CO Bands. *Nuria Calvet, Alberto Patiño, Gladis Magris C., & Paola D'Alessio.* 380, 617, 185-G8 (1991)
- The Statistics of Slow Interstellar Accretion onto Neutron Stars. *O. Blaes & M. Rajagopal.* 381, 210, 191-E10 (1991)
- Spectroscopy of Z Camelopardalis in Outburst with the Hopkins Ultraviolet Telescope. *Knox S. Long, William P. Blair, Arthur F. Davidsen, Charles W. Bowers, W. Van Dyke Dixon, Samuel T. Durrance, Paul D. Feldman, Richard C. Henry, Gerard A. Kriss, Jeffrey W. Kruk, H. Warren Moos, Olaf Vancura, Henry C. Ferguson, & Randy A. Kimble.* 381, L25, 194-D5 (1991)
- Three-dimensional Simulations of Black Hole Tori. *John F. Hawley.* 381, 496, 196-G9 (1991)
- X-Ray Spectra of Cataclysmic Variables from the Einstein Observatory. *Michael Eracleous, Jules Halpern, & Joseph Patterson.* 382, 290, 203-G1 (1991)
- Optical Excess Emission in T Tauri Stars. *Patrick Hartigan, Scott J. Kenyon, Lee Hartmann, Stephen E. Strom, Susan Edwards, Alan D. Wely, & John Stauffer.* 382, 617, 209-C1 (1991)
- Spectral Signatures of the MeV-PeV Radiation from Accreting Neutron Stars. *B. Rudak & P. Mészáros.* 383, 269, 215-E3 (1991)
- On the Near-Infrared Spectrum of FU Orionis. *Nuria Calvet, Lee Hartmann, & Scott J. Kenyon.* 383, 752, 223-E6 (1991)

The Vertical Structure of T Tauri Accretion Disks. I. Heating by the Central Star. *Fabien Malbet & Claude Bertout*. 383, 814, 224-D1 (1991)

#### STARS: ATMOSPHERES

CO Fundamental Bands in Late-Type Stars. II. Spectrum Simulations for F-K Stars. *Gunter Wiedemann & Thomas R. Ayres*. 366, 277, 4-D9 (1991)

Synthetic Spectra and Atmospheric Properties of Cool DA White Dwarfs. *P. Bergeron, F. Wesemael, & G. Fontaine*. 367, 253, 15-C1 (1991)

The Use of Iteration Factors for Temperature Correction in a Stellar Atmosphere When Convective Transport Is Present. *L. Crivellari & E. Simonneau*. 367, 612, 20-G10 (1991)

Chemical Abundances for Cyanogen-weak Giants. *R. Earle Luck*. 75, 579, 8-F11 (1991)

A Critical Analysis of the Ultraviolet Temperature Scale of the Helium-dominated DB and DBV White Dwarfs. *Peter Thejll, Stéphane Vennes, & Harry L. Shipman*. 370, 355, 51-F5 (1991)

Non-LTE Analysis of the Ofpe/WN9 Star HDE 269227 (R84). *Werner Schmutz, Claus Leitherer, Ivan Hubeny, Manfred Vogel, Wolf-Rainer Hamann, & Ulf Wesselowski*. 372, 664, 84-A1 (1991)

Thermal X-Ray Emission from Classical Novae in Optical Decline. *James MacDonald & Stéphane Vennes*. 373, L51, 97-C4 (1991)

Model Atmospheres and X-Ray Spectra of Bursting Neutron Stars. *Jerzy Madej*. 376, 161, 127-A4 (1991)

Theoretical H II Region Models: The Effects of Stellar Atmosphere Models. *I. N. Evans*. 76, 985, 38-E13 (1991)

On Spectra of X-Ray Bursters in the Expansion Phase. *J. I. Lapidus*. 377, L93, 150-E1 (1991)

A Non-Local Thermodynamic Equilibrium, Line-blanketed Synthetic Spectrum of Iota Herculis: C, Al, and Si Lines. *James A. Grigsby*. 380, 606, 185-F9 (1991)

First Ultraviolet Spectropolarimetry of Hot Supergiants. *M. Taylor, A. D. Code, K. H. Nordsieck, C. M. Anderson, B. L. Babler, K. S. Bjorkman, G. C. Clayton, A. M. Magalhães, M. R. Meade, R. E. Schulte-Ladbeck, & B. A. Whitney*. 382, L85, 211-D5 (1991)

Oxygen Abundances in Halo Stars. *Michael S. Bessell, Ralph S. Sutherland, & Kui Ruan*. 383, L71, 226-E6 (1991)

Model Atmospheres for Rotating B Stars. *George W. Collins II, Ryland J. Truax, & Steven R. Cranmer*. 77, 541, 52-B5 (1991)

#### STARS: BA II

Subgiant CH Stars. II. Chemical Compositions and the Evolutionary Connection with Barium Stars. *R. Earle Luck & Howard E. Bond*. 77, 515, 51-G1 (1991)

#### STARS: BE

The Circumstellar Disks of  $\beta$  Pictoris Analogs. *C. A. Grady, Frederick C. Bruhweiler, K. P. Cheng, W. A. Chiu, & Y. Kondo*. 367, 296, 15-F9 (1991)

Circumstellar Material around  $\lambda$  Eridani (B2e). I. Geometry and Kinematics during 1987–1988. *Myron A. Smith, Geraldine J. Peters, & C. A. Grady*. 367, 302, 15-G1 (1991)

Be Stars: Chromospheres and Cool Envelopes and Their Relation to Magnetic Fields. *A. E. Ringuelet & M. E. Iglesias*. 369, 463, 43-D10 (1991)

*EXOSAT* Observations of the X-Ray Source 2S 0114+65. *Krishna M. V. Apparao, P. Bish, & K. P. Singh*. 371, 772, 71-B6 (1991)

Flares in the X-Ray Source EXO 2030+375. *Krishna M. V. Apparao*. 375, 701, 121-D7 (1991)

Optical Emission Enhancements in Be Stars. *Krishna M. V. Apparao*. 376, 256, 128-B3 (1991)

The LkHα 101 Infrared Cluster. *M. Barsony, J. M. Schombert, & K. Kis-Halas*. 379, 221, 165-G1 (1991)

First Ultraviolet Spectropolarimetry of Be Stars from the Wisconsin Ultraviolet Photo-Polarimeter Experiment. *K. S. Bjorkman, K. H. Nordsieck, A. D. Code, C. M. Anderson, B. L. Babler, G. C. Clayton, A. M. Magalhães, M. R. Meade, M. A. Nook, R. E. Schulte-Ladbeck, M. Taylor, & B. A. Whitney*. 383, L67, 226-E1 (1991)

Model Atmospheres for Rotating B Stars. *George W. Collins II, Ryland J. Truax, & Steven R. Cranmer*. 77, 541, 52-B5 (1991)

#### STARS: BINARIES

Spectroscopy of FO Aquarii: Evidence for Reprocessing in a Hot Wind. *Phillip J. Martell & Ronald H. Kaitchuck*. 366, 286, 4-E5 (1991)

Circumstellar Material around the Massive Close Binary DH Cephei. *M. F. Corcoran*. 366, 308, 4-G8 (1991)

Sigma Observation of the Pulsar OAO 1657–415: Precise Localization at Hard X-Ray Energy and Discovery of Spin-down. *S. Mereghetti, J. Ballet, A. Lamberti, P. Mandrou, L. Natalucci, J. Paul, J. P. Roques, L. Salotti, M. Gilfanov, R. Sunyaev, G. Babalyan, E. Churazov, N. Khavenson, A. Kuznetsov, D. Stepanov, & S. Yunin*. 366, L23, 6-C11 (1991)

On the Orbital Period Change of the Binary Pulsar PSR 1913+16. *Thibault Damour & J. H. Taylor*. 366, 501, 9-C1 (1991)

Spectroscopic Binaries in the Orion Nebula Cluster. *Helmut A. Abt, Ruyu Wang & Octavio Cardona*. 367, 155, 14-A1 (1991)

Optical and Radio Observations of the Binary Pulsar 1855+09: Evolution of Pulsar Magnetic Fields and Low-Mass White Dwarf Cooling. *S. R. Kulkarni, S. Djorgovski, & A. R. Klemola*. 367, 221, 14-G4 (1991)

Conditions for Accretion-induced Collapse of White Dwarfs. *Ken'ichi Nomoto & Yoji Kondo*. 367, L19, 17-D1 (1991)

Resonant Interaction in Common Envelopes. *Noam Soker*. 367, 593, 20-F1 (1991)

On Winds and X-Rays of O-Type Stars. *Tomasz Chlebowksi & Catharine D. Garmann*. 368, 241, 26-B1 (1991)

On the Detectability of Pulsars in Close Binary Systems. *Helen M. Johnston & Shrinivas R. Kulkarni*. 368, 504, 31-D1 (1991)

Theoretical Light Curve for the Recurrent Nova RS Ophiuchi—Determination of the White Dwarf Mass, Composition, and Distance. *Mariko Kato*. 369, 471, 43-E6 (1991)

Possible Detection of TeV Gamma Rays from AM Herculis. *C. L. Bhat, R. K. Kaul, H. S. Rawat, V. K. Senecha, R. C. Rannat, M. L. Sapru, A. K. Tickoo, & H. Razdan*. 369, 475, 43-E12 (1991)

On the Explosion in a Common Envelope Scenario for Type Ia Supernovae. *James H. Applegate*. 370, 324, 51-C9 (1991)

A Search for Periodicities in the X-Ray Emission from Cataclysmic Variables. *Michael Eracleous, Joseph Patterson, & Jules Halpern*. 370, 330, 51-D1 (1991)

Near-Infrared Time-resolved Spectroscopy of the Cataclysmic Variable YY Draconis. *Mario Mateo, Paula Szkody, & Peter Garnavich*. 370, 370, 51-G8 (1991)

Mechanisms for Pulsar Eclipse. *David Eichler*. 370, L27, 53-D11 (1991)

The Effect of an External Disk on the Orbital Elements of a Central Binary. *P. Artymowicz, C. J. Clarke, S. H. Lubow, & J. E. Pringle*. 370, L35, 53-E7 (1991)

Spectroscopic Binaries in the Open Cluster Trumpler 16. *Hugo Levato, Stella Malaroda, Nidia Morrell, Beatriz García, & Carlos Hernández*. 75, 869, 13-C13 (1991)

Fokker-Planck Calculations of Star Clusters with Primordial Binaries. *Bin Gao, Jeremy Goodman, Haldan Cohn, & Brian Murphy*. 370, 567, 55-E1 (1991)

A Polytropic Model of an Accretion Disk, a Boundary Layer, and a Star. *Bohdan Paczyński*. 370, 597, 55-G11 (1991)

Does Accretion Cease When a Star Approaches Breakup? *Robert Popham & Ramesh Narayan*. 370, 604, 56-A6 (1991)

Helium Star Cataclysms. *Icko Iben, Jr., & Alexander V. Tutukov*. 370, 615, 56-B5 (1991)

The Response of Main-Sequence Stars within a Common Envelope. *Michael S. Hjellming & Ronald E. Taam*. 370, 709, 57-C1 (1991)

He Stars and He-accreting CO White Dwarfs. *Marco Limongi & Amedeo Tornambé*. 371, 317, 64-A9 (1991)

High-Precision Timing of Millisecond Pulsars. I. Astrometry and Masses of the PSR 1855+09 System. *M. F. Ryba & J. H. Taylor*. 371, 739, 70-F9 (1991)

Synchronization of the Magnetic Nova V1500 Cygni. *Gary D. Schmidt & H. S. Stockman*. 371, 749, 70-G7 (1991)

Spectroscopic Binaries in the Orion OB1 Association. *Nidia Morrell & Hugo Levato*. 75, 965, 15-F5 (1991)

Star Cluster Evolution with Primordial Binaries. II. Detailed Analysis. *Steve McMillan, Piet Hut, & Junichiro Makino*. 372, 111, 75-D5 (1991)

- The Binary Feige 24: The Mass, Radius, and Gravitational Redshift of the DA White Dwarf.** *Stéphane Vennes, John R. Thorstensen, Peter Thejll, & Harry L. Shipman.* 372, L37, 79-E5 (1991)
- Modification of Stellar Populations in Post-Core-Collapse Globular Clusters.** *S. Djorgovski, G. Piotto, E. S. Phinney, & D. F. Chernoff.* 372, L41, 79-E11 (1991)
- Type Ia Supernovae: Constraints on Baryonic Dark Matter.** *Tammy A. Sneeck & Rosemary F. G. Wyse.* 372, 448, 81-D1 (1991)
- Limits on Cluster Binaries.** *Roger W. Romani & Martin D. Weinberg.* 372, 487, 81-G5 (1991)
- Coincidence Probabilities for Spacecraft Gravitational Wave Experiments: Massive Coalescing Binaries.** *Massimo Tinto & J. W. Armstrong.* 372, 545, 82-E1 (1991)
- Double Core Evolution. IV. The Late Stages of Evolution of a  $2 M_{\odot}$  Red Giant with a  $1 M_{\odot}$  Companion.** *Ronald E. Taam & Peter Bodenheimer.* 373, 246, 89-A10 (1991)
- The Extraordinary 1989 December 14/15 Optical Flare Events on V711 Tauri.** *Gregory W. Henry & Douglas S. Hall.* 373, L9, 91-B7 (1991)
- Single and Binary Star Evolution.** *Icko Iben, Jr.* 76, 55, 24-G3 (1991)
- Is Drag Luminosity Effective in Recurrent Novae?** *Mariko Kato & Izumi Hachisu.* 373, 620, 95-F1 (1991)
- High-Resolution IUE Spectra of the Nova-like Variable IX Velorum.** *Christopher W. Mauche.* 373, 624, 95-F7 (1991)
- Bowen Fluorescence in AM Herculis Stars.** *Jonathan Schachter, Alexei V. Filippenko, Steven M. Kahn, & Frits B. S. Paerels.* 373, 633, 95-G4 (1991)
- Limits on the Space Density of Double Degenerates as Type Ia Supernova Progenitors.** *Diana Foss, Richard A. Wade, & Richard F. Green.* 374, 281, 101-E9 (1991)
- The Pulse-timing and Emission-Line Orbits of the White Dwarf in the Cataclysmic Variable AE Aquarii.** *Edward L. Robinson, Allen W. Shafter, & S. Balachandran.* 374, 298, 101-G1 (1991)
- The Infrared and Optical Pulsations of G29-38.** *Joseph Patterson, B. Zuckerman, E. E. Becklin, D. J. Tholen, & T. Hawarden.* 374, 330, 102-C1 (1991)
- The Common Envelope Phase in Classical Novae: One-dimensional Models.** *Anurag Shankar, Mario Livio, & James W. Truran.* 374, 623, 106-G6 (1991)
- X-ray to Infrared Observations of the AM Herculis System E1405-451 (V834 Centauri).** *R. M. Sambruna, L. Chiappetti, A. Treves, J. M. Bonnet-Bidaud, P. Bouchet, L. Maraschi, C. Motch, & M. Mouquet.* 374, 744, 108-C10 (1991)
- Timing Observations of the 8 Hour Binary Pulsar 2127+11C in the Globular Cluster M15.** *T. A. Prince, S. B. Anderson, S. R. Kulkarni, & A. Wolszczan.* 374, L41, 110-C1 (1991)
- V1500 Cygni: A Prediction.** *J. I. Katz.* 374, L59, 110-D11 (1991)
- A Spectroscopic Search for Colliding Stellar Winds in O-Type Close Binary Systems. I. AO Cassiopeiae.** *Douglas R. Gies & Michael S. Wiggs.* 375, 321, 114-G10 (1991)
- Noise-driven Radiative Shocks: A New Model for the Optical Quasi-periodic Oscillations of the AM Herculis Objects.** *Michael T. Wolff, Kent S. Wood, & James N. Imamura.* 375, L31, 117-D6 (1991)
- On the Orbital Circularization of Close Binaries.** *Itzhak Goldman & Tsvi Mazeh.* 376, 260, 128-B8 (1991)
- Tomographic Separation of Composite Spectra: The Components of the O-Star Spectroscopic Binary AO Cassiopeiae.** *William G. Baguado, Jr., & Douglas R. Gies.* 376, 266, 128-C1 (1991)
- Ultraviolet Variability of the Massive W-R Binary System HDE 311884 = WR 47.** *Gloria Koenigberger, Anthony F. J. Moffat, & Lawrence H. Auer.* 376, 272, 128-C9 (1991)
- Photometric Binary Stars in Praesepe and the Search for Globular Cluster Binaries.** *Michael Bolte.* 376, 514, 132-G1 (1991)
- Binary Star Observations with the Hubble Space Telescope Fine Guidance Sensors. I. ADS 11300.** *O. G. Franz, T. J. N. Kreidl, L. W. Wasserman, A. J. Bradley, G. F. Benedict, P. D. Hemenway, W. H. Jefferys, B. McArthur, J. E. McCartney, E. Nelan, P. J. Shelus, D. Story, A. L. Whipple, R. L. Duncombe, L. W. Fredrick, & Wm. F. van Altena.* 377, L17, 143-C6 (1991)
- Fragmentation of Elongated Cylindrical Clouds. III. Formation of Binary and Multiple Systems.** *Ian Bonnell, Hugo Martel, Pierre Bastien, Jean-Pierre Arcoragi, & Willy Benz.* 377, 553, 146-E5 (1991)
- Collisions of Giant Stars with Compact Objects: Hydrodynamical Calculations.** *Frederic A. Rasio & Stuart L. Shapiro.* 377, 559, 146-F1 (1991)
- Radiative-hydrodynamical Simulations of Accretion Disk Coronae.** *Fulvio Melia, Gregory J. Zylstra, & Bruce Fryxell.* 377, L101, 150-E11 (1991)
- Reinvestigation of the Binary Frequency in the Open Cluster IC 4665.** *Nidia Morrell & Helmut A. Abt.* 378, 157, 153-A1 (1991)
- The Unusual X-Ray Pulse Timing of AE Aquarii.** *O. C. De Jager.* 378, 286, 154-E1 (1991)
- A Cool Supergiant with Anomalous Behavior of the  $2800 \text{ Mg II}$  Doublet.** *G. A. Gurzadyan, Y. Kondo, S. S. Rustambekyan, Yervant Terzian, & Mario R. Perez.* 378, 298, 154-F1 (1991)
- First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.** *G. Weigelt, R. Albrecht, C. Barbieri, J. C. Blades, A. Boksenberg, P. Crane, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kamperman, I. R. King, F. Macchetto, C. D. Mackay, F. Paresce, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, & W. B. Sparks.* 378, L21, 157-C7 (1991)
- Hydrodynamics of Collisions between Binary Stars.** *Jeremy Goodman & Lars Hernquist.* 378, 637, 160-C11 (1991)
- The Optical Emission from Oscillating White Dwarf Radiative Shock Waves.** *James N. Imamura, Hussain Rashed, & Michael T. Wolff.* 378, 665, 160-F5 (1991)
- Spin Evolution and Magnetic Fields in Cataclysmic Variables.** *Andrew R. King & Jean-Pierre Lasota.* 378, 674, 160-G1 (1991)
- Binaries in a Medium of Fast Low-Mass Objects.** *Andrew Gould.* 379, 280, 166-E1 (1991)
- Neutron Star and Black Hole Binaries in the Galaxy.** *Ramesh Narayan, Tsvi Piran, & Amotz Shemi.* 379, L17, 169-B11 (1991)
- Spin-up of the White Dwarf in the Intermediate Polar 3A 0729+103.** *Jyoti Singh, P. C. Agrawal, K. M. V. Apparao, P. Vivekananda Rao, & M. B. K. Sarma.* 380, 208, 178-E11 (1991)
- The Rate of Neutron Star Binary Mergers in the Universe: Minimal Predictions for Gravity Wave Detectors.** *E. S. Phinney.* 380, L17, 181-C6 (1991)
- Constraints on the Companion Object to HD 114762.** *William D. Cochran, Arlie P. Hatzes, & Terry J. Hancock.* 380, L35, 181-E6 (1991)
- Simulations of Tidally Driven Eccentric Instabilities with Application to Superhumps.** *Stephen H. Lubow.* 381, 268, 192-C9 (1991)
- Spectroscopy of Z Camelopardalis in Outburst with the Hopkins Ultraviolet Telescope.** *Knox S. Long, William P. Blair, Arthur F. Davidsen, Charles W. Bowers, W. Van Dyke Dixon, Samuel T. Durrance, Paul D. Feldman, Richard C. Henry, Gerard A. Kiss, Jeffrey W. Kruk, H. Warren Moos, Olaf Vancura, Henry C. Ferguson, & Randy A. Kimble.* 381, L25, 194-D5 (1991)
- Gravitational Radiation from Dual Neutron Star Elliptical Binaries.** *Dieter Hild.* 381, 484, 196-F5 (1991)
- Wide Binaries in the Woolley Catalog.** *Ira Wasserman & Martin D. Weinberg.* 382, 149, 202-A12 (1991)
- X-Ray Spectra of Cataclysmic Variables from the Einstein Observatory.** *Michael Eracleous, Jules Halpern, & Joseph Patterson.* 382, 290, 203-G1 (1991)
- High-Speed Multicolor Photometry of V834 Centaurus.** *John Middleditch, James N. Imamura, Michael T. Wolff, & Thomas Y. Steiman-Cameron.* 382, 315, 204-B1 (1991)
- Deep VLA Images of Globular Clusters.** *Helen M. Johnston, Shrinivas R. Kulkarni, & W. M. Goss.* 382, L89, 211-D11 (1991)
- The Formation of Primordial Binaries in Globular Clusters by Star-Disk Interactions.** *Stephen D. Murray, C. J. Clarke, & J. E. Pringle.* 383, 192, 214-D7 (1991)
- Effects of Drag Luminosity in the Common Envelope Phase of Slow Novae.** *Mariko Kato & Izumi Hachisu.* 383, 761, 223-F3 (1991)
- An Interactive Companion to the S Star HD 35155.** *Thomas B. Ake III, Hollis R. Johnson, & Mudhaffer M. Ameen.* 383, 842, 224-F7 (1991)
- Subgiant CH Stars. II. Chemical Compositions and the Evolutionary Connection with Barium Stars.** *R. Earle Luck & Howard E. Bond.* 383, 515, 51-G1 (1991)

**STARS: BROWN DWARFS**

Cold Nuclear Fusion in Dense Metallic Hydrogen. *Charles J. Horowitz*. 367, 288, 15-E13 (1991)

ESO 207-61: A Brown Dwarf Candidate in the Hyades Moving Group. *Maria Teresa Ruiz, Marianne Y. Takamiya, & Miguel Roth*. 367, L59, 22-C7 (1991)

Gravitational Microlensing of the Galactic Bulge Stars. *B. Paczyński*. 371, L63, 73-C4 (1991)

Gravitational Microlensing by Double Stars and Planetary Systems. *Shude Mao & Bohdan Paczyński*. 374, L37, 110-B11 (1991)

Brown Dwarfs in Young Stellar Clusters. *Guy S. Stringfellow*. 375, L21, 117-C7 (1991)

The LkHα 101 Infrared Cluster. *M. Barsony, J. M. Schombert, & K. Kis-Halas*. 379, 221, 165-G1 (1991)

Constraints on the Companion Object to HD 114762. *William D. Cochran, Artie P. Hatzes, & Terry J. Hancock*. 380, L35, 181-E6 (1991)

**STARS: CARBON**

Detection of  $^{13}\text{C}$  Isotopomers of  $\text{HC}_5\text{N}$  ( $J = 9-8$ ) in the Circumstellar Envelope of IRC +10216. *M. B. Bell & P. A. Feldman*. 367, L33, 17-E8 (1991)

Radial Velocity Distribution and Line Strengths of 33 Carbon Stars in the Galactic Bulge. *Neil D. Tyson & R. Michael Rich*. 367, 547, 20-B6 (1991)

Nitrogen Abundances in Carbon-rich Stars That Are Progenitors to Planetary Nebulae. *M. Jura*. 372, 208, 76-E7 (1991)

The Mid-Infrared Spectrum of the Carbon Star HD 38218 and Its Possible Relation to Polycyclic Aromatic Hydrocarbons. *Richard H. Buss, Jr., A. G. G. M. Tielens, & Theodore P. Snow*. 372, 281, 77-D8 (1991)

Single and Binary Star Evolution. *Icko Iben, Jr.* 76, 55, 24-G3 (1991)

Large Molecule Production by Mass-losing Carbon Stars: The Primary Source of Interstellar Polycyclic Aromatic Hydrocarbons? *William B. Latter*. 377, 187, 140-C5 (1991)

Dust Temperatures in the Circumstellar Shell of TX Piscium. *J. Wirsich*. 377, 285, 141-E1 (1991)

Lithium Abundances in Carbon Stars. *Grant R. Denn, R. Earle Luck, & David L. Lambert*. 377, 657, 147-G5 (1991)

Three Newly Recognized Dwarf Carbon Stars. *Paul J. Green, Bruce Margon, & D. Jack MacConnell*. 380, L31, 181-E1 (1991)

Abundances in Red Giant Stars: Nitrogen Isotopes in Carbon-rich Molecular Envelopes. *P. G. Wannier, B.-G Andersson, H. Olofsson, N. Ukita, & K. Young*. 380, 593, 185-E8 (1991)

On the Nature of the Excess 100 Micron Flux Associated with Carbon Stars. *Michael P. Egan & Chun Ming Leung*. 383, 314, 216-B1 (1991)

New Candidates for Carbon Stars with Silicate Features. *S. Josephine Chan & Sun Kwok*. 383, 837, 224-F1 (1991)

Subgiant CH Stars. II. Chemical Compositions and the Evolutionary Connection with Barium Stars. *R. Earle Luck & Howard E. Bond*. 77, 515, 51-G1 (1991)

**STARS: CATALOGS**

A Spectrophotometric Atlas of White Dwarfs Compiled from the *JUE* Archives. *Gary Wegner & Steven R. Swanson*. 75, 507, 7-E13 (1991)

A Critical Appraisal of Published Values of [Fe/H] for K II–IV Stars. *Benjamin J. Taylor*. 76, 715, 34-E12 (1991)

**STARS: CEPHEIDS**

Classical Cepheids with RV Tauri Characteristics? *Pawel Moskalik & J. Robert Buchler*. 366, 300, 4-F12 (1991)

New Cepheid Distances to Nearby Galaxies Based on *BVRI* CCD Photometry. II. The Local Group Galaxy M33. *Wendy L. Freedman, Christine D. Wilson, & Barry F. Madore*. 372, 455, 81-D9 (1991)

Classical Cepheid Luminosities from Binary Companions. *Nancy Remage Evans*. 372, 597, 83-B1 (1991)

Single and Binary Star Evolution. *Icko Iben, Jr.* 76, 55, 24-G3 (1991)

Radial Velocities of 26 Northern Milky Way Cepheids. *Mark R. Metzger, John A. R. Caldwell, James K. McCarthy, & Paul L. Schechter*. 76, 803, 35-G3 (1991)

Absolute Magnitudes and Kinematic Properties of Cepheids. *Teresa D. Wilson, Thomas G. Barnes III, Suzanne L. Hawley, & William H. Jefferys*. 378, 708, 161-B11 (1991)

Periodic Stellar Pulsations: Stability Analysis and Amplitude Equations. *J. Robert Buchler, Paweł Moskalik, & Géza Kovács*. 380, 185, 178-D1 (1991)

**STARS: CHROMOSPHERES**

Stellar Lyman-Alpha Emission and the Local Interstellar Medium. *Wayne Landsman & Theodore Simon*. 366, L79, 11-D9 (1991)

Be Stars: Chromospheres and Cool Envelopes and Their Relation to Magnetic Fields. *A. E. Ringuelet & M. E. Iglesias*. 369, 463, 43-D10 (1991)

Evolution of the Chromospheres and Winds of Low- and Intermediate-Mass Giant Stars. *P. G. Judge & R. E. Stencel*. 371, 357, 64-E3 (1991)

Rotational Modulation in *JUE* Spectra of Cool Dwarf Chromospheres. I. Data Analysis and Period Search Techniques. *K. L. Hallam, B. Altnar, & A. S. Endal*. 372, 610, 83-C1 (1991)

Ca II H and K Measurements Made at Mount Wilson Observatory, 1966–1983. *Douglas K. Duncan, Arthur H. Vaughan, Olin C. Wilson, George W. Preston, James Frazer, Howard Lanning, Anthony Misch, Jean Mueller, David Sooymer, L. Woodard, Sallie L. Baliunas, Robert W. Noyes, Lee W. Hartmann, Alain Porter, Cornelis Zwaan, Frans Middelkoop, René G. M. Rutten, & Dimitri Mihalas*. 76, 383, 29-G9 (1991)

X-Ray Emission from Hybrid-Chromosphere Stars. *Alexander Brown, Stephen A. Drake, Michael E. Van Steenberg, & Jeffrey L. Linsky*. 373, 614, 95-E9 (1991)

The Chromospheric Activity of Low-Mass Stars in the Hyades. *John R. Stauffer, Mark S. Giampapa, William Herbst, James M. Vincent, Lee W. Hartmann, & Robert A. Stern*. 374, 142, 99-G1 (1991)

Rotation and Emission Lines in Stars and Accretion Disks. *Keith Home & Steven H. Saar*. 374, L55, 110-D6 (1991)

The Many Faces of F Stars: A Rotational Modulation Study of Capella, Procyon, and Caph with the *International Ultraviolet Explorer*. *Thomas R. Ayres*. 375, 704, 121-D11 (1991)

The Chromospheric Emission-Age Relation for Stars of the Lower Main Sequence and Its Implications for the Star Formation Rate. *David R. Soderblom, Douglas K. Duncan, & Dean R. H. Johnson*. 375, 722, 121-F5 (1991)

Dust Temperatures in the Circumstellar Shell of TX Piscium. *J. Wirsich*. 377, 285, 141-E1 (1991)

First Results from the Goddard High-Resolution Spectrograph: The Chromosphere of  $\alpha$  Tauri. *Kenneth G. Carpenter, Richard D. Robinson, Glenn M. Wahlgren, Thomas B. Ake, Dennis C. Ebbets, Jeffrey L. Linsky, Alexander Brown, & Frederick M. Walter*. 377, L45, 143-E11 (1991)

Heating Mechanism(s) for Transition Layers in Giants. *Erika Böhm-Vitense & José Mena-Werth*. 378, 718, 161-C8 (1991)

Fe II Emission Lines. I. Chromospheric Spectra of Red Giants. *P. G. Judge & C. Jordan*. 77, 75, 44-E1 (1991)

The Onset of Chromospheric Activity among the A and F Stars. *Theodore Simon & Wayne Landsman*. 380, 200, 178-E3 (1991)

A Connection between Long-Term Luminosity Variations and Orbital Period Changes in Chromospherically Active Binaries. *Douglas S. Hall*. 380, L85, 188-F1 (1991)

Magnetoacoustic Heating of the Solar Chromosphere. *Joseph M. Davila & S. M. Chitre*. 381, L31, 194-D12 (1991)

*JUE* Observations of Solar-Type Stars in the Pleiades and the Hyades. *Jean-Pierre Caillault, Osmi Vilhu, & Jeffrey L. Linsky*. 383, 594, 221-F1 (1991)

**STARS: CIRCUMSTELLAR SHELLS**

Far-Infrared and Submillimeter-Wavelength Observations of Star-forming Dense Cores. I. Spectra. *E. F. Ladd, Fred C. Adams, S. Casey, J. A. Davidson, G. A. Fuller, D. A. Harper, P. C. Myers, & R. Padman*. 366, 203, 3-E7 (1991)

Circumstellar Material around the Massive Close Binary DH Cephei. *M. F. Corcoran*. 366, 308, 4-G8 (1991)

AG Pegasi: A Multishell Radio Source. *H. T. Kenny, A. R. Taylor, & E. R. Seaquist*. 366, 549, 9-G7 (1991)

Using SN 1987A Light Echoes to Determine Mass Loss from the Progenitor. *Arlin P. S. Crofts & William E. Kunkel*. 366, L73, 11-D1 (1991)

- A Search for Circumstellar Dust around HR 10, a Proposed  $\beta$  Pictoris Star. *Kwang-Ping Cheng, C. A. Grady, & Frederick C. Bruhweiler.* 366, L87, 11-E7 (1991)
- The Circumstellar Disks of  $\beta$  Pictoris Analogs. *C. A. Grady, Frederick C. Bruhweiler, K. P. Cheng, W. A. Chiu, & Y. Kondo.* 367, 296, 15-F9 (1991)
- Circumstellar Material around  $\lambda$  Eridani (B2e). I. Geometry and Kinematics during 1987–1988. *Myron A. Smith, Geraldine J. Peters, & C. A. Grady.* 367, 302, 15-G1 (1991)
- Distribution of Dust about  $\alpha$  Ceti and  $\alpha$  Orionis Based on 11 Micron Spatial Interferometry. *M. Bester, W. C. Danchi, C. G. Degiacomi, C. H. Townes, & T. R. Geballe.* 367, L27, 17-E1 (1991)
- Detection of  $^{13}\text{C}$  Isotopomers of  $\text{HC}_3\text{N}$  ( $J = 9-8$ ) in the Circumstellar Envelope of IRC +10216. *M. B. Bell & P. A. Feldman.* 367, L33, 17-E8 (1991)
- The Nature of the Dust around R Coronae Borealis Stars: Isolated Amorphous Carbon or Graphite Fractals? *J. H. Hecht.* 367, 635, 21-B9 (1991)
- Excitation of Millimeter and Submillimeter Water Masers. *David A. Neufeld & Gary J. Melnick.* 368, 215, 25-F11 (1991)
- Energy Distributions of Symbiotic Novae. *Greg L. Bryan & Sun Kwok.* 368, 252, 26-C1 (1991)
- Search for Vega-like Nearby Stars with 12 Micron Excess. *Hartmut H. Aumann & Ronald G. Probst.* 368, 264, 26-D1 (1991)
- The Millimeter-Wave Spectrum of Highly vibrationally Excited SiO. *R. Mollaaghataba, C. A. Gottlieb, J. M. Vrilek, & P. Thaddeus.* 368, L19, 28-D1 (1991)
- Axisymmetric Models of Circumstellar Dust Shells. *Alan J. Collison & John D. Fix.* 368, 545, 31-G7 (1991)
- Dust Properties around Evolved Stars from Far-Infrared Size Limits. *Paul M. Harvey, Daniel F. Lester, David Brock, & Marshall Joy.* 368, 558, 32-A8 (1991)
- On the Possible Bipolar Nature of 21 Micron IRAS Sources. *Bruce J. Hrivnak & S. Kwok.* 368, 564, 32-B1 (1991)
- IRAS Low-Resolution Spectral Observations of the 10 and 18 Micron Silicate Emission Features. *Janet P. Simpson.* 368, 570, 32-B13 (1991)
- Astronomical Detection of  $\text{H}_2\text{CCC}$ . *J. Cernicharo, C. A. Gottlieb, M. Guélin, T. C. Killian, G. Paubert, P. Thaddeus, & J. M. Vrilek.* 368, L39, 35-C7 (1991)
- Astronomical Detection of  $\text{H}_2\text{CCCC}$ . *J. Cernicharo, C. A. Gottlieb, M. Guélin, T. C. Killian, P. Thaddeus, & J. M. Vrilek.* 368, L43, 35-C11 (1991)
- Circular Polarization in 1612 MHz OH Maser Emission from OH/IR Stars. *Philip J. Zell & John D. Fix.* 369, 506, 44-A9 (1991)
- First Results from the Faint Object Camera: SN 1987A. *P. Jakobsen, R. Albrecht, C. Barbieri, J. C. Blades, A. Boksenberg, P. Crane, J. M. Deharveng, M. J. Disney, T. M. Kamperman, I. R. King, F. Macchetto, C. D. Mackay, F. Paresce, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, W. B. Sparks, R. P. Kirshner, & N. Panagia.* 369, L63, 46-B1 (1991)
- A Survey for Infrared Excesses among High Galactic Latitude SAO Stars. *Robert E. Stencel & Dana E. Backman.* 75, 905, 14-A1 (1991)
- Mass Outflow in the Nearby Proto-Planetary System  $\beta$  Pictoris. *Frederick C. Bruhweiler, Yoji Kondo, & C. A. Grady.* 371, L27, 66-D7 (1991)
- The Carbon-rich Proto-Planetary Nebula IRAS 22272+5435. *Bruce J. Hrivnak & Sun Kwok.* 371, 631, 69-D6 (1991)
- Aberration and Advection Effects in Expanding Spherically Symmetric Shells. *A. Peraiah.* 371, 673, 70-A1 (1991)
- New OH Main-Line Detections of OH/IR Stars. *Dale F. Dickinson & B. E. Turner.* 75, 1323, 23-A9 (1991)
- The Mid-Infrared Spectrum of the Carbon Star HD 38218 and Its Possible Relation to Polycyclic Aromatic Hydrocarbons. *Richard H. Buss, Jr., A. G. G. M. Tielens, & Theodore P. Snow.* 372, 281, 77-D8 (1991)
- Detection of Silicates in the  $\beta$  Pictoris Disk. *C. M. Telesco & R. F. Knacke.* 372, L29, 79-D7 (1991)
- Mixing Layers in Stellar Outflows. *J. Cantó & A. C. Raga.* 372, 646, 83-F7 (1991)
- The SiH Vibrational Stretch as an Indicator of the Chemical State of Interstellar Grains. *Marla H. Moore, Toshihiko Tanabe, & Joseph A. Nuth.* 373, L31, 91-D7 (1991)
- Two Micron Morphology of Candidate Protostars. *Motohide Tamura, Ian Gatley, William Waller, & Michael W. Werner.* 374, L25, 103-E7 (1991)
- Stellar Occultation of Polarized Light from Circumstellar Electrons. II. Flat Envelopes Viewed at Arbitrary Inclination. *Geoffrey K. Fox & John C. Brown.* 375, 300, 114-F1 (1991)
- Observations and Chemistry of Interstellar Refractory Elements. *B. E. Turner.* 376, 573, 133-E1 (1991)
- Proto-Planetary Nebulae. II. The Shock-heated Bipolar Nebulae GL 618 and M2-56. *Robert W. Goodrich.* 376, 654, 134-D12 (1991)
- Dust Temperatures in the Circumstellar Shell of TX Piscium. *J. Wirsich.* 377, 285, 141-E1 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Resolved Velocity and Density Structure in the  $\beta$  Pictoris Circumstellar Gas. *A. Boggess, Frederick C. Bruhweiler, C. A. Grady, Dennis C. Ebbe, Yoji Kondo, L. M. Trafton, John C. Brandt, & S. R. Heap.* 377, L49, 143-F1 (1991)
- Polycyclic Aromatic Hydrocarbon Optical Properties and Contribution to the Acceleration of Stellar Outflows. *Isabelle Cherchneff, John R. Barker, & Alexander G. G. M. Tielens.* 377, 541, 146-D6 (1991)
- 321 GHz Submillimeter Water Masers around Evolved Stars. *Karl M. Menten & Gary J. Melnick.* 377, 647, 147-F8 (1991)
- IRAS 17380–3031: A New Dusty Late WC-Type Wolf-Rayet Star. *Martin Cohen, K. A. van der Hucht, P. M. Williams, & P. S. Thé.* 378, 302, 154-F7 (1991)
- A Gaseous Tail Ablated from the Supergiant IRS 7 near the Galactic Center. *E. Serabyn, J. H. Lacy, & J. M. Achermann.* 378, 557, 159-C9 (1991)
- The Molecular Envelope of NGC 7027. *John H. Bieging, David Wilner, & Harley A. Thronson, Jr.* 379, 271, 166-D9 (1991)
- LMC-2 as the Blowout of a Hot Superbubble. *Qingde Wang & David J. Helfand.* 379, 327, 167-B5 (1991)
- An Observational Connection between Circumstellar Disk Mass and Molecular Outflows. *Sylvie Cabrit & Philippe André.* 379, L25, 169-C6 (1991)
- The Circumstellar Shell of SN 1987A. *Ding Luo & Richard McCray.* 379, 659, 172-G9 (1991)
- Stellar Occultation of Polarized Light from Circumstellar Electrons. III. General Axisymmetric Envelopes. *Geoffrey K. Fox.* 379, 663, 173-A1 (1991)
- Models for Light Scattering by Dust around Herbig-Haro Objects. *Alberto Noriega-Crespo, Nuria Calvet, & Karl-Heinz Böhm.* 379, 676, 173-B1 (1991)
- Effects of Aberration and Advection on Line Formation. *A. Peraiah.* 380, 212, 178-F1 (1991)
- Properties of the SN 1987A Circumstellar Ring and the Distance to the Large Magellanic Cloud. *N. Panagia, R. Gilmozzi, F. Macchetto, H.-M. Adorf, & R. P. Kirshner.* 380, L23, 181-D1 (1991)
- Circumstellar Emission from SN 1987A. *Peter Lundqvist & Claes Fransson.* 380, 575, 185-D1 (1991)
- Abundances in Red Giant Stars: Nitrogen Isotopes in Carbon-rich Molecular Envelopes. *P. G. Wannier, B.-G. Andersson, H. Olofsson, N. Ukita, & K. Young.* 380, 593, 185-E8 (1991)
- Particle Emissivity in Circumstellar Disks. *Steven V. W. Beckwith & Anneila I. Sargent.* 381, 250, 192-B1 (1991)
- A Model for Tidally Driven Eccentric Instabilities in Fluid Disks. *Stephen H. Lubow.* 381, 259, 192-B12 (1991)
- Simulations of Tidally Driven Eccentric Instabilities with Application to Superhumps. *Stephen H. Lubow.* 381, 268, 192-C9 (1991)
- R Aquarii: H $\alpha$  Map of Subarcsecond Inner Structure. *E. K. Hege, C. K. Allen, & W. J. Cocke.* 381, 543, 197-D6 (1991)
- Are FU Orionis Stars Younger than T Tauri Stars? Submillimeter Constraints on Circumstellar Disks. *David A. Weintraub, Göran Sandell, & William D. Duncan.* 382, 270, 203-E8 (1991)
- CN and HCN in the Infrared Spectrum of IRC +10216. *G. R. Wiedemann, Kenneth H. Hinkle, John J. Keady, D. Deming, & D. E. Jennings.* 382, 321, 204-B10 (1991)
- The Molecular Structure around HL Tauri. *A. I. Sargent & S. V. W. Beckwith.* 382, L31, 205-D6 (1991)

- On the Evolution of Gravitationally Unstable Protostellar Disks.** *Leslie Tomley, Patrick Cassen, & Thomas Steiman-Cameron.* 382, 530, 208-B6 (1991)
- Far-Infrared and Submillimeter Wavelength Observations of Star-forming Dense Cores. II. Images.** *E. F. Ladd, Fred C. Adams, S. Casey, J. A. Davidson, G. A. Fuller, D. A. Harper, P. C. Myers, & R. Padman.* 382, 555, 208-D7 (1991)
- The Temperature of the Circumstellar Envelope of Alpha Orionis.** *Bernadette Rodgers & Alfred E. Glassgold.* 382, 606, 209-B1 (1991)
- On the Nature of the Excess 100 Micron Flux Associated with Carbon Stars.** *Michael P. Egan & Chun Ming Leung.* 383, 314, 216-B1 (1991)
- The Dusty Envelopes of FU Orionis Variables.** *Scott J. Kenyon & Lee W. Hartmann.* 383, 664, 222-E1 (1991)
- The Dust Debris around HR 4796.** *M. Jura.* 383, L79, 226-F1 (1991)
- STARS: COLLAPSED**
- Stability of a Collapsed Star in Bimetric General Relativity. II.** *Amos Harpaz & Nathan Rosen.* 371, 254, 63-C9 (1991)
- Numerical Solution of the General Relativistic Boltzmann Equation for Massive and Massless Particles.** *Hugh Harleston & Katherine A. Holcomb.* 372, 225, 76-F13 (1991)
- Stationary Accelerators around Keplerian Disks of Aligned Magnetized Collapsed Objects: Pair Production and Gamma-Ray Emission.** *K. S. Cheng & M. Ruderman.* 373, 187, 88-C9 (1991)
- High-Temperature Neutrino-Nucleus Processes in Stellar Collapse.** *George M. Fuller & Bradley S. Meyer.* 376, 701, 135-A12 (1991)
- Neutron Star and Black Hole Binaries in the Galaxy.** *Ramesh Narayan, Tsvi Piran, & Amotz Shemi.* 379, L17, 169-B11 (1991)
- Magnetohydrodynamic Cosmologies.** *R. Portugal & I. Damiao Soares.* 380, 330, 182-D5 (1991)
- Diffusion Processes in the Collapse of a Radiating Spherical Body.** *R. Chan, L. Herrera, J. A. F. Pacheco, & N. O. Santos.* 382, 255, 203-D1 (1991)
- STARS: CORONAE**
- Magnetic Confinement, Alfvén Wave Reflection, and the Origins of X-Ray and Mass-Loss "Dividing Lines" for Late-Type Giants and Supergiants.** *R. Rosner, C.-H. An, Z. E. Musielak, R. L. Moore, & S. T. Suess.* 372, L91, 85-E5 (1991)
- Flux-limited Diffusion in a Scattering Medium.** *Fulvio Melia & Gregory J. Zylstra.* 374, 732, 108-B9 (1991)
- Digging in the Coronal Graveyard: A ROSAT Observation of the Red Giant Arcturus.** *Thomas R. Ayres, Thomas A. Fleming, & Juergen H. M. M. Schmitt.* 376, L45, 137-C7 (1991)
- Isothermal, Compton-heated Coronae above Accretion Disks.** *Eve C. Ostriker, Christopher F. McKee, & Richard I. Klein.* 377, 593, 147-B3 (1991)
- Radiative-hydrodynamical Simulations of Accretion Disk Coronae.** *Fulvio Melia, Gregory J. Zylstra, & Bruce Fryxell.* 377, L101, 150-E11 (1991)
- Numerical Simulations of Flares on M Dwarf Stars. I. Hydrodynamics and Coronal X-Ray Emission.** *Chung-Chieh Cheng & Roberto Pallavicini.* 381, 234, 191-G12 (1991)
- The Coronal Dividing Line in the ROSAT X-Ray All-Sky Survey.** *Bernhard Haisch, J. H. M. M. Schmitt, & C. Rosso.* 383, L15, 219-C1 (1991)
- STARS: R CORONAE BOREALIS**
- The Nature of the Dust around R Coronae Borealis Stars: Isolated Amorphous Carbon or Graphite Fractals?** *J. H. Hecht.* 367, 635, 21-B9 (1991)
- STARS: DIAMETERS**
- Distribution of Dust about  $\alpha$  Ceti and  $\alpha$  Orionis Based on 11 Micron Spatial Interferometry.** *M. Bester, W. C. Danchi, C. G. Degiacomi, C. H. Townes, & T. R. Geballe.* 367, L27, 17-E1 (1991)
- Multichannel Astrometric Photometer-based Parallaxes of Evolved Stars:  $\chi$  Cygni, 51 Andromedae, and OP Andromedae.** *John W. Stein.* 377, 669, 148-A5 (1991)
- STARS: DWARF NOVAE**
- Evidence for CNO Processed Material in the Accretion Disk of GP Comae.** *T. R. Marsh, Keith Horne, & Simon Rosen.* 366, 535, 9-F1 (1991)
- A Search for Periodicities in the X-Ray Emission from Cataclysmic Variables.** *Michael Eracleous, Joseph Patterson, & Jules Halpern.* 370, 330, 51-D1 (1991)
- Near-Infrared Time-resolved Spectroscopy of the Cataclysmic Variable YY Draconis.** *Mario Mateo, Paula Szkody, & Peter Garnavich.* 370, 370, 51-G8 (1991)
- Helium Star Cataclysmics.** *Icko Iben, Jr., & Alexander V. Tutukov.* 370, 615, 56-B5 (1991)
- On the X-Ray-emitting Boundary Layer of the Dwarf Nova VW Hydry.** *Christopher W. Mauche, Richard A. Wade, Ronald S. Polidan, Hans van der Woerd, & Frits B. S. Paerels.* 372, 659, 83-G7 (1991)
- The Near-Infrared Spectra of Low-Mass X-Ray Binaries and Related Objects.** *A. P. Cowley, P. C. Schmidtke, D. Crampton, J. B. Hutchings, & M. Bolte.* 373, 228, 88-G1 (1991)
- The Interoutburst Behavior of Cataclysmic Variables.** *Paula Szkody, Janet A. Mattei, Elizabeth O. Waagen, & Clay Stablein.* 76, 359, 29-E1 (1991)
- High-Resolution IUE Spectra of the Nova-like Variable IX Velorum.** *Christopher W. Mauche.* 373, 624, 95-F7 (1991)
- The Pulse-timing and Emission-Line Orbit of the White Dwarf in the Cataclysmic Variable AE Aquarii.** *Edward L. Robinson, Allen W. Shafter, & S. Balachandran.* 374, 298, 101-G1 (1991)
- Rotation and Emission Lines in Stars and Accretion Disks.** *Keith Horne & Steven H. Saar.* 374, L55, 110-D6 (1991)
- The White Dwarf Mass Distribution in Classical Nova Systems.** *Hans Ritter, Michael Politano, Mario Livio, & Ronald F. Webbink.* 376, 177, 127-B10 (1991)
- Eclipse Studies of the Dwarf Nova HT Cassiopeiae. I. Observations and System Parameters.** *Keith Horne, Janet H. Wood, & Rae F. Stiening.* 378, 271, 154-C11 (1991)
- Spin Evolution and Magnetic Fields in Cataclysmic Variables.** *Andrew R. King & Jean-Pierre Lasota.* 378, 674, 160-G1 (1991)
- The Eclipsing AM Herculis Variable H1907+690.** *R. A. Remillard, B. A. Stroozas, S. Tapia, & A. Silber.* 379, 715, 173-E13 (1991)
- Spin-up of the White Dwarf in the Intermediate Polar 3A 0729+103.** *Jyoti Singh, P. C. Agrawal, K. M. V. Apparao, P. Vivekananda Rao, & M. B. K. Sarma.* 380, 208, 178-E11 (1991)
- Spectroscopy of Z Camelopardalis in Outburst with the Hopkins Ultraviolet Telescope.** *Knox S. Long, William P. Blair, Arthur F. Davidsen, Charles W. Bowers, W. Van Dyke Dixon, Samuel T. Durrance, Paul D. Feldman, Richard C. Henry, Gerard A. Kriss, Jeffrey W. Kruk, H. Warren Moos, Olaf Vancura, Henry C. Ferguson, & Randy A. Kimble.* 381, L25, 194-D5 (1991)
- V795 Herculis (=PG 1711+336), A Peculiar Intermediate Polar without Strong X-Ray Emission.** *Erhao Zhang, Edward L. Robinson, Tod F. Ramseyer, Mathew D. Shetrone, & Rae F. Stiening.* 381, 534, 197-C10 (1991)
- X-Ray Spectra of Cataclysmic Variables from the Einstein Observatory.** *Michael Eracleous, Jules Halpern, & Joseph Patterson.* 382, 290, 203-G1 (1991)
- High-Speed Multicolor Photometry of V834 Centaurus.** *John Middleditch, James N. Imamura, Michael T. Wolff, & Thomas Y. Steiman-Cameron.* 382, 315, 204-B1 (1991)
- STARS: EARLY-TYPE**
- On Winds and X-Rays of O-Type Stars.** *Tomasz Chlebowski & Catharine D. Garmany.* 368, 241, 26-B1 (1991)
- Search for Vega-like Nearby Stars with 12 Micron Excess.** *Harlum H. Aumann & Ronald G. Probst.* 368, 264, 26-D1 (1991)
- Detection of Small-Amplitude Pulsations in HD 34656 (O7 II).** *A. W. Fullerton, D. R. Gies, & C. T. Bolton.* 368, L35, 35-C1 (1991)
- Criteria for the Spectral Classification of B Stars in the Ultraviolet.** *Janet Rountree & George Sonneborn.* 369, 515, 44-B5 (1991)
- IRAS 23545+6508, a Dissociating Star: Prototype for a New Observational Class?** *P. E. Dewdney, R. S. Roger, C. R. Purton, & W. H. McCutcheon.* 370, 243, 50-C1 (1991)
- Echelle Spectroscopy of CD -41° 13967: The Young Central Star of a New Planetary Nebula.** *James K. McCarthy, R. Michael Rich, S. R. Becker, K. Butler, D. Husfeld, & H. G. Groth.* 371, 380, 64-G1 (1991)
- Central Star Temperatures of Low-Excitation Planetary Nebulae.** *James B. Kaler & George H. Jacoby.* 372, 215, 76-F1 (1991)

- DD 13: A Very Young and Heavily Reddened Early O Star in the Large Magellanic Cloud.** Peter S. Conti & Edward L. Fitzpatrick. 373, 100, 87-C5 (1991)
- JUE Observations of Early-Type Stars at High Galactic Latitudes.** D. A. Quin, P. J. F. Brown, E. S. Conlon, P. L. Dufton, & F. P. Keenan. 375, 342, 115-B7 (1991)
- UBV Photometry of OB<sup>+</sup> Stars in the Southern Milky Way.** J. S. Drilling. 76, 1033, 39-C11 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Evidence for Photospheric Microturbulence in Early O Stars: Are Surface Gravities Systematically Underestimated?** I. Hubeny, S. R. Heap, & B. Alten. 377, L33, 143-D11 (1991)
- Photoionization Modeling of Magellanic Cloud Planetary Nebulae. II.** M. A. Dopita & S. J. Meatheringham. 377, 480, 145-F6 (1991)
- Observations of Stellar Winds from Hot Stars at 1.3 Millimeters.** Claus Leitherer & Carmelle Robert. 377, 629, 147-E1 (1991)
- Predicted Extreme-Ultraviolet Line Emission for Nearby Main-Sequence B Stars.** J. J. MacFarlane, J. P. Cassinelli, B. Y. Welsh, P. W. Vedder, J. V. Vallerga, & W. L. Waldron. 380, 564, 185-C1 (1991)
- A Non-Local Thermodynamic Equilibrium, Line-blanketed Synthetic Spectrum of Iota Herculis: C, Al, and Si Lines.** James A. Grigsby. 380, 606, 185-F9 (1991)
- Direct Evidence for Stellar Wind X-Ray Absorption in O Stars.** Wayne L. Waldron. 382, 603, 209-A9 (1991)
- A Model for the Infrared Emission from an OB Star Cluster Environment.** D. Leisawitz. 77, 451, 51-B1 (1991)
- Model Atmospheres for Rotating B Stars.** George W. Collins II, Ryland J. Truax, & Steven R. Cranmer. 77, 541, 52-B5 (1991)
- STARS: ECLIPSING BINARIES**
- The Orbital Ephemeris and Eclipse Transitions of the Low-Mass X-Ray Binary EXO 0748-676.** A. N. Parmar, A. P. Smale, F. Verbunt, & R. H. D. Corbet. 366, 253, 4-B9 (1991)
- Interpreting Epsilon Aurigae.** Sean M. Carroll, Edward F. Guinan, George P. McCook, & Robert A. Donahue. 367, 278, 15-E1 (1991)
- Multimission Observations of 4U 1538-52.** L. R. Cominsky & F. Moraes. 370, 670, 56-F10 (1991)
- Analysis and Solution of the Light and Radial Velocity Curves of the Contact Binary TY Bootis.** E. F. Milone, G. Grosman, D. J. J. Fry, & D. H. Bradstreet. 370, 677, 56-G5 (1991)
- A Light Synthesis Study of W Ursae Majoris.** Albert P. Linnell. 374, 307, 102-A1 (1991)
- On the Nature of the Anomalously Slow Apsidal Motion of DI Herculis.** Kh. F. Khalilullin, S. A. Khodykin, & A. I. Zakharov. 375, 314, 114-G1 (1991)
- Mass Loss in the 96 Day Binary UU Cancri.** Joel A. Eaton, Douglas S. Hall, & R. Kent Honeycutt. 376, 289, 128-E1 (1991)
- Simultaneous Light and Radial Velocity Curve Solutions for U Cephei.** J. B. Rafer & N. L. Markworth. 377, 278, 141-D5 (1991)
- On the Nature and Evolution of the Windy Binary Pulsar PSR 1744-24A.** Jacob Shaham & Marco Tavani. 377, 588, 147-A11 (1991)
- Eclipse Studies of the Dwarf Nova HT Cassiopeiae. I. Observations and System Parameters.** Keith Horne, Janet H. Wood, & Rae F. Stiening. 378, 271, 154-C11 (1991)
- JUE Investigation of Mass Flow in the Interacting Binary U Sagittae.** George E. McCluskey, Jr., Carolina Pacienza Salas McCluskey, & Yoji Kondo. 378, 281, 154-D9 (1991)
- Evidence for External Plasma around the K Dwarf Component of the Eclipsing Binary V471 Tauri.** Arthur Young, Lee Rouler, & Andrew Skumanich. 378, L25, 157-D1 (1991)
- The Ultraviolet Light Curves of W Ursae Majoris.** Albert P. Linnell. 379, 338, 167-C3 (1991)
- Wind Collision Effects in the Early-Type Close Binaries HD 47129 and AO Cassiopeiae.** Jorge Sahade & Estela Brandi. 379, 706, 173-E1 (1991)
- The Eclipsing AM Herculis Variable H1907+690.** R. A. Remillard, B. A. Stroozas, S. Tapia, & A. Silber. 379, 715, 173-E13 (1991)
- Does SV Centauri Harbor an Accretion Disk?** Albert P. Linnell & Xania Scheick. 379, 721, 173-F7 (1991)
- High-Precision Timing of Millisecond Pulsars. II. Astrometry, Orbital Evolution, and Eclipses of PSR 1957+20.** M. F. Ryba & J. H. Taylor. 380, 557, 185-B7 (1991)
- A Connection between Long-Term Luminosity Variations and Orbital Period Changes in Chromospherically Active Binaries.** Douglas S. Hall. 380, L85, 188-F1 (1991)
- Outflow Hydrodynamics in the Eclipsing Millisecond Pulsar Binaries PSR 1957+20 and PSR 1744-24A.** Marco Tavani & Leigh Brookshaw. 381, L21, 194-C13 (1991)
- JUE Spectra of the Eclipsing Binary NN Serpentis.** Janet H. Wood & Thomas R. Marsh. 381, 551, 197-E1 (1991)
- A Test of the Starspot Hypothesis for W-Type W Ursae Majoris Light Curves.** Albert P. Linnell. 383, 330, 216-C8 (1991)
- STARS: EMISSION-LINE**
- The Near-Infrared Spectra of Low-Mass X-Ray Binaries and Related Objects.** A. P. Cowley, P. C. Schmidke, D. Crampton, J. B. Hutchings, & M. Bolte. 373, 228, 88-G1 (1991)
- Bowen Fluorescence in AM Herculis Stars.** Jonathan Schachter, Alexei V. Filippenko, Steven M. Kahn, & Frits B. S. Paerels. 373, 633, 95-G4 (1991)
- Ultraviolet High-Excitation Fe II Fluorescence Lines Excited by O VI, C IV, and H I Resonance Emission As Seen in JUE Spectra.** Walter A. Feibelman, Frederick C. Bruhweiler, & Sveneric Johansson. 373, 649, 96-A8 (1991)
- Rotation and Emission Lines in Stars and Accretion Disks.** Keith Horne & Steven H. Saar. 374, L55, 110-D6 (1991)
- The Many Faces of F Stars: A Rotational Modulation Study of Capella, Procyon, and Caph with the International Ultraviolet Explorer.** Thomas R. Ayres. 375, 704, 121-D11 (1991)
- Ultraviolet Fe VII Absorption and Fe II Emission Lines of Central Stars of Planetary Nebulae.** Kwang-Ping Cheng, Walter A. Feibelman, & Frederick C. Bruhweiler. 377, 235, 140-G7 (1991)
- Heating Mechanism(s) for Transition Layers in Giants.** Erika Böhm-Vitense & José Mena-Werth. 378, 718, 161-C8 (1991)
- Predicted Extreme-Ultraviolet Line Emission for Nearby Main-Sequence B Stars.** J. J. MacFarlane, J. P. Cassinelli, B. Y. Welsh, P. W. Vedder, J. V. Vallerga, & W. L. Waldron. 380, 564, 185-C1 (1991)
- N III Line Emission in Planetary Nebulae: Not Bowen Fluorescence.** S. O. Kastner & A. K. Bhatia. 381, L59, 199-D7 (1991)
- STARS: EVOLUTION**
- Application of Oxygen-enhanced Evolutionary Sequences to the Horizontal Branch of M15.** Ben Dorman, Young-Wook Lee, & Don A. VandenBerg. 366, 115, 2-D11 (1991)
- Stellar Population Synthesis Revisited.** Stéphane Charlot & Gustavo Bruzual. 367, 126, 13-E5 (1991)
- s-Process Nucleosynthesis in Massive Stars and the Weak Component.** I. Evolution and Neutron Captures in a 25  $M_{\odot}$  Star. C. M. Raiteri, M. Busso, R. Gallino, G. Picchio, & L. Pulone. 367, 228, 14-G13 (1991)
- Evolutionary Models of Halo Stars with Rotation. I. Evidence for Differential Rotation with Depth in Stars.** Marc H. Pinsonneault, Constantine P. Deliyannis, & Pierre Demarque. 367, 239, 15-A12 (1991)
- Stellar Evolution and Period Changes in RR Lyrae Stars.** Young-Wook Lee. 367, 524, 19-G7 (1991)
- Instabilities and Clumping in SN 1987A. I. Early Evolution in Two Dimensions.** Bruce Fryxell, Ewald Müller, & David Arnett. 367, 619, 21-A5 (1991)
- Wolf-Rayet Stars as Starting Points or as Endpoints of the Evolution of Massive Stars?** H. J. G. L. M. Lamers, A. Maeder, W. Schmutz, & J. P. Cassinelli. 368, 538, 31-F12 (1991)
- Neutron Star Thermal Evolution.** Kenneth A. Van Riper. 75, 449, 6-G7 (1991)
- Asteroseismology of White Dwarf Stars. I. Adiabatic Results.** P. A. Bradley & D. E. Winget. 75, 463, 7-A13 (1991)
- Star Clusters in the Clouds of Magellan.** Sidney van den Bergh. 369, 1, 36-A11 (1991)
- Star Formation in Taurus-Auriga: The High-Mass Stars.** Frederick M. Walter & William T. Boyd. 370, 318, 51-C1 (1991)
- Multicolor CCD Imaging of Supergiants in the Disk of NGC 253.** T. J. Davidge, O. Le Févre, & C. C. Clark. 370, 559, 55-D7 (1991)
- Helium Star Cataclysms.** Icko Iben, Jr., & Alexander V. Tutukov. 370, 615, 56-B5 (1991)

- Lithium in the Most Extreme Halo Stars: Trends with Metallicity. *Constantine P. Deliyannis & Pierre Demarque.* 370, L89, 59-E5 (1991)
- Lithium, Age, and Metallicity in Open Clusters. *Ann Merchant Boesgaard.* 370, L95, 59-E12 (1991)
- He Stars and He-accreting CO White Dwarfs. *Marco Limongi & Amedeo Tornambé.* 371, 317, 64-A9 (1991)
- Carbon Isotope Ratios along the Giant Branch of M67. *Kalpana Krishnaswamy Gilroy & Jeffery A. Brown.* 371, 578, 68-F7 (1991)
- Diffusion and Mixing of Lithium and Helium in Population II Dwarfs. *Charles R. Proffitt & Georges Michaud.* 371, 584, 68-G1 (1991)
- Nitrogen Abundances in Carbon-rich Stars That Are Progenitors to Planetary Nebulae. *M. Juric.* 372, 208, 76-E7 (1991)
- Steady State Energy Sources in Neutron Stars. *Kenneth A. Van Riper.* 372, 251, 77-A13 (1991)
- Modification of Stellar Populations in Post-Core-Collapse Globular Clusters. *S. Djorgovski, G. Piotto, E. S. Phinney, & D. F. Chernoff.* 372, L41, 79-E11 (1991)
- Double Core Evolution. IV. The Late Stages of Evolution of a  $2 M_{\odot}$  Red Giant with a  $1 M_{\odot}$  Companion. *Ronald E. Taam & Peter Bodenheimer.* 373, 246, 89-A10 (1991)
- Single and Binary Star Evolution. *Icko Iben, Jr.* 76, 55, 24-G3 (1991)
- Stellar Evolutionary Models from the Zero-Age Main Sequence to the First Thermal Pulse. *John C. Lattanzio.* 76, 215, 27-B9 (1991)
- Blue Loops during Core Helium Burning as the Consequence of Moderate Convective Envelope Overshooting in Stars of Intermediate to High Mass. *Richard B. Stothers & Chao-wen Chin.* 374, 288, 101-F3 (1991)
- LMC SMP 64: The Youngest Planetary Nebula? *M. A. Dopita & S. J. Meatheringham.* 374, L21, 103-E1 (1991)
- Shell Helium Burning in Low-Mass Stars. I. Models in Thermal Equilibrium. *Masayuki Y. Fujimoto & Icko Iben, Jr.* 374, 631, 107-A1 (1991)
- Isochrones for H-burning Globular Cluster Stars. II. The Metallicity Range  $-2.3 < [\text{Fe}/\text{H}] < -0.5$ . *Oscar Straniero & Alessandro Chieffi.* 76, 525, 32-D1 (1991)
- Chemical Abundances in Planetary Nebulae: Basic Data and Correlations between Elements. *M. Perinotto.* 76, 687, 34-C9 (1991)
- Detection of a Galactic Color Gradient for Blue Horizontal-Branch Stars of the Halo Field and Implications for the Halo Age and Density Distributions. *George W. Preston, Stephen A. Shectman, & Timothy C. Beers.* 375, 121, 112-E1 (1991)
- The  $p$ -Mode Oscillation Spectra of an Evolving  $1 M_{\odot}$  Sun-like Star. *D. B. Guenther.* 375, 352, 115-C8 (1991)
- Brown Dwarfs in Young Stellar Clusters. *Guy S. Stringfellow.* 375, L21, 117-C7 (1991)
- Period Changes and Evolution in RV Tauri Stars. *John R. Percy, Dimitar D. Sasselov, Amy Alfred, & Greg Scott.* 375, 691, 121-C7 (1991)
- The Chromospheric Emission-Age Relation for Stars of the Lower Main Sequence and Its Implications for the Star Formation Rate. *David R. Soderblom, Douglas K. Duncan, & Dean R. H. Johnson.* 375, 722, 121-F5 (1991)
- From Wind to Superwind: The Evolution of Mass-Loss Rates for Mira Models. *G. H. Bowen & L. A. Willson.* 375, L53, 124-C1 (1991)
- On the Formation of Globular Clusters. I. Dynamical Limits on Globular Cluster Metallicities. *J. H. Brown, A. Burkert, & James W. Truran.* 376, 115, 126-D1 (1991)
- Rotational Evolution of Solar-Type Stars. I. Main-Sequence Evolution. *K. B. MacGregor & M. Brenner.* 376, 204, 127-D13 (1991)
- The Evolution of He-burning Stars: Horizontal and Asymptotic Branches in Galactic Globulars. *V. Castellani, A. Chieffi, & L. Pulone.* 76, 911, 37-C5 (1991)
- Collisions of Giant Stars with Compact Objects: Hydrodynamical Calculations. *Frederic A. Rasio & Stuart L. Shapiro.* 377, 559, 146-F1 (1991)
- A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope. *S. O. Kepler, D. E. Winget, R. E. Nather, P. A. Bradley, A. D. Grauer, G. Fontaine, P. Bergeron, G. Vauclair, C. F. Claver, T. M. K. Marar, S. Seetha, B. N. Ashoka, T. Mazeh, E. Leibowitz, N. Dolez, M. Chevreton, M. A. Barstow, J. C. Clemens, S. J. Kleinman, A. E. Sansom, R. W. Tweedy,*
- A. Kanaan, B. P. Hine, J. L. Provencal, F. Wesemael, M. A. Wood, P. Brassard, J.-E. Solheim, & P.-I. Emanuelson.* 378, L45, 162-E7 (1991)
- On the Sodium Excess in the Atmospheres of Yellow Supergiants. *N. Prantzos, A. Coc, & J. P. Thibaud.* 379, 729, 173-G1 (1991)
- The Stellar Content and Structure of the Globular Cluster NGC 5053. *Gregory G. Fahrlman, Harvey B. Richer, & James Nemec.* 380, 124, 177-E11 (1991)
- The K Parameter and Evolution of the Radio Pulsars. *Wen Xu & Xinji Wu.* 380, 550, 185-A12 (1991)
- Evolutionary Sequences of Stellar Models of Intermediate and High Mass Including Convective Core Overshooting. *Chao-wen Chin & Richard B. Stothers.* 77, 299, 48-C1 (1991)
- On Equation of State Interpolation Errors in Stellar Interior Calculations. *Ben Dorman, Alan W. Irwin, & Brian B. Pedersen.* 381, 228, 191-G4 (1991)
- Advanced Evolutionary Phases of Large-Metallicity Low-Mass Stars and the Problem of the Ultraviolet Excess of Elliptical Galaxies. *Marco Castellani & Amedeo Tornambé.* 381, 393, 195-E9 (1991)
- Soft X-Ray Pulses from Neutron Star Glitches. *Kenneth A. Van Riper, Richard I. Epstein, & Guy S. Miller.* 381, L47, 199-C1 (1991)
- Detection of the Helium Flash Gap in the Integrated  $(B - V)$  versus  $(B - V)$  Diagram for 624 Large Magellanic Cloud Clusters. *E. Bica, J. J. Clariá, H. Dotto, J. F. C. Santos, Jr., & A. Piatti.* 381, L51, 199-C7 (1991)
- Metal Opacities and Convective Core Overshooting in Population I Stars. *Richard B. Stothers & Chao-wen Chin.* 381, L67, 199-E7 (1991)
- Wide Binaries in the Woolley Catalog. *Ira Wasserman & Martin D. Weinberg.* 382, 149, 202-A12 (1991)
- Asymptotic Theory for the Spatial Distribution of Protostellar Emission. *Fred C. Adams.* 382, 544, 208-C8 (1991)
- Massive Star Evolution and SN 1987A. *David Arnett.* 383, 295, 215-G8 (1991)
- About the Stage of Evolution of Wolf-Rayet Stars. *Anne B. Underhill.* 383, 729, 223-C6 (1991)
- Evolution of Compact Binary Systems with X-Ray Heating. *Amos Harpaz & Saul Rappaport.* 383, 739, 223-D3 (1991)
- A Conjecture Regarding the Evolution of Dwarf Stars into Red Giants. *P. Eggleton & R. C. Cannon.* 383, 757, 223-E12 (1991)
- Post-Asymptotic Giant Branch Nonradial Instability Strips. *Letizia Stanghellini, Arthur N. Cox, & Sumner Starrfield.* 383, 766, 223-F10 (1991)
- Observational Tests of Convective Core Overshooting in Stars of Intermediate to High Mass in the Galaxy. *Richard B. Stothers.* 383, 820, 224-D8 (1991)
- Implications of Helium Diffusion for Globular Cluster Isochrones and Luminosity Functions. *Charles R. Proffit & Don A. VandenBerg.* 77, 473, 51-C10 (1991)
- Subgiant CH Stars. II. Chemical Compositions and the Evolutionary Connection with Barium Stars. *R. Earle Luck & Howard E. Bond.* 77, 515, 51-G1 (1991)
- STARS: FAINT BLUE**
- The Case Low-Dispersion Northern Sky Survey. XII. A Region in Southern Canes Venatici. *Peter Pesch, N. Sanduleak, & C. B. Stephenson.* 76, 1043, 40-B1 (1991)
- STARS: FLARE**
- Flares on Mira Stars? *Bradley E. Schaefer.* 366, L39, 6-E1 (1991)
- Nonthermal Radio Emission from the X-Ray-Bright K5 IV Star 1E 1751+7046. *Stephen L. Skinner.* 368, 272, 26-D11 (1991)
- Dynamic Magnetic Reconnection at an X-Type Neutral Point. *I. J. D. Craig & A. N. McClymont.* 371, L41, 66-F1 (1991)
- The Extraordinary 1989 December 14/15 Optical Flare Events on V711 Tauri. *Gregory W. Henry & Douglas S. Hall.* 373, L9, 91-B7 (1991)
- The Great Flare of 1985 April 12 on AD Leonis. *Suzanne L. Hawley & Bjørn R. Petersen.* 378, 725, 161-D1 (1991)
- Avalanches and the Distribution of Solar Flares. *Edward T. Lu & Russell J. Hamilton.* 380, L89, 188-F5 (1991)
- Numerical Simulations of Flares on M Dwarf Stars. I. Hydrodynamics and Coronal X-Ray Emission. *Chung-Chieh Cheng & Roberto Pallavicini.* 381, 234, 191-G12 (1991)

**STARS: FORMATION**

- Abundances of Hydrogen Sulfide in Star-forming Regions.** *Y. C. Minh, L. M. Ziurys, W. M. Irvine, & D. McGonagle.* 366, 192, 3-D9 (1991)
- On the [O/Fe] versus [Fe/H] Relationship and the Progenitors of Type I Supernovae.** *C. Abia, R. Canal, & J. Isern.* 366, 198, 3-E1 (1991)
- Far-Infrared and Submillimeter-Wavelength Observations of Star-forming Dense Cores. I. Spectra.** *E. F. Ladd, Fred C. Adams, S. Casey, J. A. Davidson, G. A. Fuller, D. A. Harper, P. C. Myers, & R. Padman.* 366, 203, 3-E7 (1991)
- The Star-forming Disk and CO Bar in M101.** *Jeffrey D. P. Kenney, Nick Z. Scoville, & Christine D. Wilson.* 366, 432, 8-C1 (1991)
- Thermal Instabilities in Proto-Globular Clusters Resulting from Time-dependent Potentials.** *Stephen D. Murray & Douglas N. C. Lin.* 367, 149, 13-G6 (1991)
- Spectroscopy of Taurus Cloud Brown Dwarf Candidates.** *John Stauffer, Terry Herter, Donald Hamilton, George H. Rieke, Marcia J. Rieke, Ron Probst, & William Forrest.* 367, L23, 17-D7 (1991)
- Effect of a QSO on the Interstellar Medium of Its Host Galaxy.** *Smita Shanbhag.* 367, 462, 19-B5 (1991)
- Nitrogen Abundance in Comet Halley.** *Susan Wyckoff, Stephen C. Teiger, & Lisa Engel.* 367, 641, 21-C1 (1991)
- Magnetic Flux Loss from Interstellar Clouds with Various Grain-Size Distributions.** *Ryoichi Nishi, Takenori Nakano, & Toyoharu Umebayashi.* 368, 181, 25-C1 (1991)
- Excitation of Millimeter and Submillimeter Water Masers.** *David A. Neufeld & Gary J. Melnick.* 368, 215, 25-F11 (1991)
- Star Clusters in the Clouds of Magellan.** *Sidney van den Bergh.* 369, 1, 36-A11 (1991)
- A Cosmos Study of IC 1613.** *Paul W. Hodge, Toby R. Smith, Paul B. Eskridge, Harvey T. MacGillivray, & Steven M. Beard.* 369, 372, 42-D5 (1991)
- Ionization Fronts and Shocked Flows: The Structure of the Orion Nebula at 0°.1.** *J. Jeff Hester, R. Gilmozzi, C. R. O'Dell, S. M. Faber, Bel Campbell, Arthur Code, Douglas G. Currie, G. Edward Danielson, S. P. Ewald, Edward J. Groth, Jon A. Holtzman, T. Kelsall, Tod R. Lauer, Robert M. Light, Roger Lynds, Earl J. O'Neil, Jr., Edward J. Shaya, & James A. Westphal.* 369, L75, 46-C7 (1991)
- OB Star Formation and H I Production in Molecular Clouds in M33.** *Christine D. Wilson & Nick Scoville.* 370, 184, 49-D11 (1991)
- Molecular Hydrogen in the Vicinity of NGC 7538 IRS 1 and IRS 2: Temperature and Ortho-to-Para Ratio.** *Susan Hoban, Dennis C. Reuter, Michael J. Mumma, & Alex D. Storrs.* 370, 228, 50-A10 (1991)
- Star Formation in Taurus-Auriga: The High-Mass Stars.** *Frederick M. Walter & William T. Boyd.* 370, 318, 51-C1 (1991)
- Star Formation and the Nature of Bipolar Outflows.** *Frank H. Shu, Steven P. Ruden, Charles J. Lada, & Susana Lizano.* 370, L31, 53-E1 (1991)
- The Effect of an External Disk on the Orbital Elements of a Central Binary.** *P. Artynowicz, C. J. Clarke, S. H. Lubow, & J. E. Pringle.* 370, L35, 53-E7 (1991)
- A Study of Star Formation in the Disks of Sa Galaxies.** *Nelson Caldwell, Robert Kennicutt, Andrew C. Phillips, & Robert A. Schommer.* 370, 526, 54-G12 (1991)
- Protostellar Condensations in the Core of NGC 2024.** *D. C. Lis, J. E. Carlstrom, & T. G. Phillips.* 370, 583, 55-F5 (1991)
- Does Accretion Cease When a Star Approaches Breakup?** *Robert Popham & Ramesh Narayan.* 370, 604, 56-A6 (1991)
- $N_2H^+$  in Orion: Chemical Clues to the Dynamics of the Quiescent Gas.** *M. Womack, L. M. Ziurys, & S. Wyckoff.* 370, L99, 59-F1 (1991)
- Ambipolar Diffusion, Cloud Cores, and Star Formation: Two-dimensional, Cylindrically Symmetric Contraction. I. The Issues, Formulation of the Problem, and Method of Solution.** *Telenachos Ch. Mouschovias & Scott A. Morton.* 371, 296, 63-G1 (1991)
- The Rate and Efficiency of High-Mass Star Formation along the Hubble Sequence.** *Nicholas A. Devereux & Judith S. Young.* 371, 515, 68-A1 (1991)
- Thermal and Nonthermal Motions in Dense Cores.** *P. C. Myers, E. F. Ladd, & G. A. Fuller.* 372, L95, 85-E9 (1991)
- The Extinction to the  $H_2$  Line Emission in the DR 21 Outflow Source.** *Daniel Nadeau, Martin Riopele, & T. R. Geballe.* 372, L103, 85-F5 (1991)
- Dynamical Evolution and Molecular Abundances of Interstellar Clouds.** *Sheo S. Prasad, Karen R. Heere, & Shankar P. Tarafdar.* 373, 123, 87-E5 (1991)
- A Millimeter-Wave Line Study of L1287: A Case of Induced Star Formation by Stellar Wind Compression?** *Ji Yang, Tomofumi Umemoto, Takahiro Iwata, & Yasuo Fukui.* 373, 137, 87-F7 (1991)
- Magnetic Braking, Ambipolar Diffusion, Cloud Cores, and Star Formation: Natural Length Scales and Protostellar Masses.** *Telenachos Ch. Mouschovias.* 373, 169, 88-B3 (1991)
- VLBI Observations of Interstellar Ammonia Masers.** *Preethi Pratap, Karl M. Menten, Mark J. Reid, James M. Moran, & C. Malcolm Walmsley.* 373, L13, 91-B12 (1991)
- Collisional Pumping of  $H_2O$  Masers in Star-forming Regions.** *Nikolaos D. Kyafis & Colin A. Norman.* 373, 525, 94-D13 (1991)
- Nitric Oxide in Star-forming Regions: Further Evidence for Interstellar N-O Bonds.** *L. M. Ziurys, D. McGonagle, Y. Minh, & W. M. Irvine.* 373, 535, 94-E11 (1991)
- The Dense, Inner Part of the Protostellar Disk: Protostellar Candidates in GGD 27 IRS.** *Takuya Yamashita, Yasuhiro Murata, Ryoei Kawabe, Norio Kizu, & Motohide Tamura.* 373, 560, 95-A1 (1991)
- Probing the Core of Cepheus A: Millimeter and Submillimeter Observations.** *G. H. Moriarty-Schieven, R. L. Snell, & V. A. Hughes.* 374, 169, 100-B2 (1991)
- Two Micron Morphology of Candidate Protostars.** *Motohide Tamura, Ian Gatley, William Waller, & Michael W. Werner.* 374, L25, 103-E7 (1991)
- The Collapse of Cylindrical Isothermal and Polytropic Clouds with Rotation.** *Ian Bonnell & Pierre Bastien.* 374, 610, 106-F5 (1991)
- Roseland and Planck Mean Opacities of a Zero-Metallicity Gas.** *Paolo Lenzini, David F. Chernoff, & Edwin E. Salpeter.* 76, 759, 35-B13 (1991)
- The Evolution of Intermediate-Mass Protostars. I. Basic Results.** *Francesco Palla & Steven W. Stahler.* 375, 288, 114-E1 (1991)
- The Properties of NGC 2777: Are Companion Galaxies Young?** *Halton Arp & Jack W. Sulentic.* 375, 569, 119-G1 (1991)
- The Dynamical Evolution of the Protosolar Nebula.** *Steven P. Ruden & James B. Pollack.* 375, 740, 121-G11 (1991)
- The Equilibria and Evolutions of Magnetized, Rotating, Isothermal Clouds. V. The Effect of the Toroidal Field.** *Kohji Tomisaka.* 376, 190, 127-C1 (1991)
- NGC 1333 IRAS 4: A Very Young, Low-Luminosity Binary System.** *Göran Sandell, Colin Aspin, William D. Duncan, Adrian P. G. Russell, & E. Ian Robson.* 376, L17, 130-C1 (1991)
- Dense Cores in Dark Clouds. VI. Shapes.** *P. C. Myers, G. A. Fuller, A. A. Goodman, & P. J. Benson.* 376, 561, 133-D1 (1991)
- Testing Models of Low-Mass Star Formation: High-Resolution Far-Infrared Observations of L1551 IRS 5.** *Harold M. Butner, Neal J. Evans II, Daniel F. Lester, Russell M. Levereault, & Stephen E. Strom.* 376, 636, 134-C6 (1991)
- A Numerical Study of Star Formation in Interacting Disk Galaxies.** *J. Christopher Mihos, Douglas O. Richstone, & Gregory D. Bothun.* 377, 72, 139-A1 (1991)
- Two Micron Spectroscopy of Infrared Sources in NGC 2071.** *D. M. Walther, T. R. Geballe, & E. I. Robson.* 377, 246, 141-A9 (1991)
- The Molecular Structure of a Starburst:  $^{13}CO$  in the Nucleus of Maffei 2.** *Robert L. Hurt & Jean L. Turner.* 377, 434, 145-B8 (1991)
- On Molecular Cloud Scaling Laws and Star Formation.** *R. N. Henriksen.* 377, 500, 146-A1 (1991)
- U-shaped Outflow in the Lynds 1221 Dark Cloud: An Example of Interaction of Outflows with Ambient Molecular Clouds.** *Tomofumi Umemoto, Naomi Hirano, Osamu Kameya, Yasuo Fukui, Nario Kuno, & Keiya Takakubo.* 377, 510, 146-A13 (1991)
- The Dense Molecular Envelope around the Compact H II Region G5.89–0.39 (W28 A2).** *Yolanda Gómez, Luis F. Rodriguez, Guido Garay, & James M. Moran.* 377, 519, 146-B9 (1991)
- Fragmentation of Elongated Cylindrical Clouds. III. Formation of Binary and Multiple Systems.** *Ian Bonnell, Hugo Martel, Pierre Bastien, Jean-Pierre Arcoragi, & Willy Benz.* 377, 553, 146-E5 (1991)

- Compact Starbursts in Ultraluminous Infrared Galaxies. *J. J. Condon, Z.-P. Huang, Q. F. Yin, & T. X. Thuan.* 378, 65, 151-G5 (1991)
- Topography of the Galactic Disk: Z-Structure and Large-Scale Star Formation. *Emilio J. Alfaro, Jesús Cabrera-Caño, & Antonio J. Delgado.* 378, 106, 152-C10 (1991)
- Fragmentation of Elongated Cylindrical Clouds. I. Isothermal Clouds. *Pierre Bastien, Jean-Pierre Arcoragi, Willy Benz, Ian Bonnell, & Hugo Martel.* 378, 255, 154-B5 (1991)
- Infrared Polarization Images of Star-forming Regions. I. The Ubiquity of Bipolar Structure. *M. Tamura, Ian Galley, R. R. Joyce, M. Ueno, H. Suto, & M. Sekiguchi.* 378, 611, 160-A1 (1991)
- Massive Star Formation and Superwinds in IRAS 19254–7245 (The "Superantennae"). *Luis Colina, Sebastian Lipari, & F. Macchietto.* 379, 113, 164-D5 (1991)
- An Observational Connection between Circumstellar Disk Mass and Molecular Outflows. *Sylvie Cabrit & Philippe André.* 379, L25, 169-C6 (1991)
- A Catalog of Bright-rimmed Clouds with *IRAS* Point Sources: Candidates for Star Formation by Radiation-driven Implosion. I. The Northern Hemisphere. *Koiji Sugitani, Yasuo Fukui, & Katsu Ogura.* 77, 59, 44-B1 (1991)
- Star Formation and the Molecular Content of IC 342. *Leslie J. Sage & P. M. Solomon.* 380, 392, 183-B7 (1991)
- Millimeter Continuum Observations of Galactic Center Giant Molecular Cloud Cores. *D. C. Lis, J. E. Carlstrom, & Jocelyn Keene.* 380, 429, 183-E7 (1991)
- Fragmentation of Elongated Cylindrical Clouds. II. Polytropic Clouds. *Jean-Pierre Arcoragi, Ian Bonnell, Hugo Martel, Willy Benz, & Pierre Bastien.* 380, 476, 184-B7 (1991)
- The Discovery of a New, Very Strong, and Widespread Interstellar Methanol Maser Line. *Karl M. Menten.* 380, L75, 188-E1 (1991)
- The Starburst Ring around the Seyfert Nucleus in NGC 7469. *A. S. Wilson, T. T. Helfer, C. A. Haniff, & M. J. Ward.* 381, 79, 190-A6 (1991)
- Orbit Crowding of Molecular Gas at a Bar-Spiral Arm Transition Zone in M83. *Jeffrey D. P. Kenney & Steven D. Lord.* 381, 118, 190-D13 (1991)
- Recent Star Formation in the Interacting Galaxy System NGC 520. *S. A. Stanford.* 381, 409, 195-G1 (1991)
- On the Evolution of Gravitationally Unstable Protostellar Disks. *Leslie Tompley, Patrick Cassen, & Thomas Steiman-Cameron.* 382, 530, 208-B6 (1991)
- Asymptotic Theory for the Spatial Distribution of Protostellar Emission. *Fred C. Adams.* 382, 544, 208-C8 (1991)
- First Observations of the CO  $J = 6-5$  Transition in Starburst Galaxies. *A. I. Harris, R. E. Hills, J. Stutzki, U. U. Graf, A. P. G. Russell, & R. Genzel.* 382, L75, 211-C7 (1991)
- The Formation of Primordial Binaries in Globular Clusters by Star-Disk Interactions. *Stephen D. Murray, C. J. Clarke, & J. E. Pringle.* 383, 192, 214-D7 (1991)
- Time-dependent Radio Sources in the Star-forming Region Cepheus A (East). *V.A. Hughes.* 383, 280, 215-F1 (1991)
- Gravitational Fragmentation: A Comparison with W49A. *Eric R. Keto, John C. Lattanzio, & Joe J. Monaghan.* 383, 639, 222-B12 (1991)
- Aperture Synthesis CS(2-1) Observations of a Young Stellar Object GL 490: Accretion Flow in Gas Disk. *Akiko Nakamura, Ryohei Kawabe, Yoshimi Kitamura, Masato Ishiguro, Yasuhiro Murata, & Nagayoshi Ohashi.* 383, L81, 226-F5 (1991)
- STARS: U GEMINORUM**
- A Study of the Ultraviolet Evolution of U Geminorum between Outbursts. *Alan L. Kiplinger, Edward M. Sion, & Paula Szkody.* 366, 569, 10-B1 (1991)
- STARS: HIGH-VELOCITY**
- Two High-Velocity Stars Shot Out from the Core of the Globular Cluster 47 Tucanae. *G. Meylan, P. Dubath, & M. Mayor.* 383, 587, 221-E4 (1991)
- STARS: HORIZONTAL-BRANCH**
- Application of Oxygen-enhanced Evolutionary Sequences to the Horizontal Branch of M15. *Ben Dorman, Young-Wook Lee, & Don A. VandenBerg.* 366, 115, 2-D11 (1991)
- Evolutionary Models of Halo Stars with Rotation. I. Evidence for Differential Rotation with Depth in Stars. *Marc H. Pinsonneault, Constantine P. Deliyannis, & Pierre Demarque.* 367, 239, 15-A12 (1991)
- Stellar Evolution and Period Changes in RR Lyrae Stars. *Young-Wook Lee.* 367, 524, 19-G7 (1991)
- Single and Binary Star Evolution. *Icko Iben, Jr.* 76, 55, 24-G3 (1991)
- The Globular Cluster  $\omega$  Centauri: The Origin of the Mysterious Correlation between the RR Lyrae Luminosity and [Fe/H]. *Young-Wook Lee.* 373, L43, 97-B7 (1991)
- Detection of a Galactic Color Gradient for Blue Horizontal-Branch Stars of the Halo Field and Implications for the Halo Age and Density Distributions. *George W. Preston, Stephen A. Shectman, & Timothy C. Beers.* 375, 121, 112-E1 (1991)
- The Evolution of He-burning Stars: Horizontal and Asymptotic Branches in Galactic Globulars. *V. Castellani, A. Chieffi, & L. Pulone.* 76, 911, 37-C5 (1991)
- Photoelectric UVB Photometry of Stars Selected in the HK Objective-Prism Survey. *George W. Preston, Stephen A. Shectman, & Timothy C. Beers.* 76, 1001, 38-G5 (1991)
- Population Studies. X. Constraints on the Mass and Extent of the Galaxy's Dark Corona. *John E. Norris & M. R. S. Hawkins.* 380, 104, 177-C11 (1991)
- JHK Imaging of a Field in Baade's Window. *T. J. Davidge.* 380, 116, 177-E1 (1991)
- The Galactic Globular Cluster System: Theoretical Constraints for  $\alpha$ -enhanced Compositions. *D. Bencivelli, F. Caputo, M. Manteiga, & M. L. Quarta.* 380, 484, 184-C1 (1991)
- STARS: INDIVIDUAL**
- Constellation Name: AE Aquarii**
- The Pulse-timing and Emission-Line Orbits of the White Dwarf in the Cataclysmic Variable AE Aquarii. *Edward L. Robinson, Allen W. Shafter, & S. Balachandran.* 374, 298, 101-G1 (1991)
- The Unusual X-Ray Pulse Timing of AE Aquarii. *O. C. De Jager.* 378, 286, 154-E1 (1991)
- Constellation Name: FO Aquarii**
- Spectroscopy of FO Aquarii: Evidence for Reprocessing in a Hot Wind. *Phillip J. Mariell & Ronald H. Kaitchuck.* 366, 286, 4-E5 (1991)
- Constellation Name: R Aquarii**
- First Results from the Faint Object Camera: Imaging the Core of R Aquarii. *F. Paresce, R. Albrecht, C. Barbieri, J. C. Blades, A. Bokkenberg, P. Crane, J. M. Deharveng, M. Disney, P. Jakobson, T. M. Kamperman, I. R. King, F. Macchietto, C. D. Mackay, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Noia, & W. B. Sparks.* 369, L67, 46-B7 (1991)
- Ultraviolet and Optical Spectroscopy of the R Aquarii Symmetrical Jet. *J. M. Hollis, R. J. Oliverson, M. Kafatos, A. G. Michalitsianos, & R. M. Wagner.* 371, 227, 140-F1 (1991)
- R Aquarii: Hα Map of Subarcsecond Inner Structure. *E. K. Hege, C. K. Allen, & W. J. Cocke.* 381, 543, 197-D6 (1991)
- Constellation Name: Aquila X-1**
- Detection of Coherent 7.6 Hz Oscillations during a Burst from Aquila X-1. *R. J. Schoelkopf & R. L. Kelley.* 375, 696, 121-D1 (1991)
- Constellation Name:  $\alpha$  Aurigae**
- The Many Faces of F Stars: A Rotational Modulation Study of Capella, Procyon, and Caph with the *International Ultraviolet Explorer*. *Thomas R. Ayres.* 375, 704, 121-D1 (1991)
- Constellation Name:  $\epsilon$  Aurigae**
- Interpreting Epsilon Aurigae. *Sean M. Carroll, Edward F. Guinan, George P. McCook, & Robert A. Donahue.* 367, 278, 15-E1 (1991)
- Constellation Name:  $\alpha$  Bootis**
- Digging in the Coronal Graveyard: A ROSAT Observation of the Red Giant Arcturus. *Thomas R. Ayres, Thomas A. Fleming, & Juergen H. M. M. Schmitt.* 376, L45, 137-C7 (1991)
- Constellation Name:  $\xi$  Bootis**
- Can the Starpatch on  $\xi$  Bootis A Be Explained by Using Tangential Flows? *Clifford G. Toner & Barry J. LaBonte.* 368, 633, 33-A10 (1991)
- Constellation Name: CN Bootis**
- Digging in the Coronal Graveyard: A ROSAT Observation of the Red Giant Arcturus. *Thomas R. Ayres, Thomas A. Fleming, & Juergen H. M. M. Schmitt.* 376, L45, 137-C7 (1991)

**Constellation Name: TY Bootis**

**Analysis and Solution of the Light and Radial Velocity Curves of the Contact Binary TY Bootis.** *E. F. Milone, G. Groisman, D. J. I. Fry, & D. H. Bradstreet.* 370, 677, 56-G5 (1991)

**Constellation Name: Z Camelopardalis**

**Spectroscopy of Z Camelopardalis in Outburst with the Hopkins Ultraviolet Telescope.** *Knox S. Long, William P. Blair, Arthur F. Davidsen, Charles W. Bowers, W. Van Dyke Dixon, Samuel T. Durrance, Paul D. Feldman, Richard C. Henry, Gerard A. Kriss, Jeffrey W. Kruk, H. Warren Moos, Olaf Vancura, Henry C. Ferguson, & Randy A. Kimble.* 381, L25, 128-D5 (1991)

**Constellation Name: 53 Camelopardalis**

**A Crucial Test of the Diffusion Model: 53 Camelopardalis.** *J. Babel & G. Michaud.* 366, 560, 10-A5 (1991)

**Constellation Name: UU Cancri**

**Mass Loss in the 96 Day Binary UU Cancri.** *Joel A. Eaton, Douglas S. Hall, & R. Kent Honeycutt.* 376, 289, 128-E1 (1991)

**Constellation Name: β Canis Majoris**

**The Interstellar Tunnel of Neutral-free Gas toward β Canis Majoris.** *Barry Y. Welsh.* 373, 556, 94-G8 (1991)

**Constellation Name: EZ Canis Majoris**

**On the Wind Geometry of the Wolf-Rayet Star EZ Canis Majoris.** *R. E. Schulte-Ladbeck, K. H. Nordsieck, M. Taylor, M. A. Nook, K. S. Bjorkman, A. M. Magalhães, & C. M. Anderson.* 382, 301, 204-A1 (1991)

**Constellation Name: Z Canis Majoris**

**The High State of the FU Orionis Variable Z Canis Majoris.** *F. V. Hessman, J. Eislöffel, R. Mundt, L. W. Hartmann, W. Herbst, & J. Krautter.* 370, 384, 52-A10 (1991)

**Constellation Name: α Canis Minoris**

**Detection of Possible p-Mode Oscillations on Procyon.** *Timothy M. Brown, Ronald L. Gilliland, Robert W. Noyes, & Lawrence W. Ramsey.* 368, 599, 32-E8 (1991)

**The Many Faces of F Stars: A Rotational Modulation Study of Capella, Procyon, and Caph with the International Ultraviolet Explorer.** *Thomas R. Ayres.* 375, 704, 121-D11 (1991)

**Constellation Name: β Cassiopeiae**

**The Many Faces of F Stars: A Rotational Modulation Study of Capella, Procyon, and Caph with the International Ultraviolet Explorer.** *Thomas R. Ayres.* 375, 704, 121-D11 (1991)

**Constellation Name: κ Cassiopeiae**

**First Ultraviolet Spectropolarimetry of Hot Supergiants.** *M. Taylor, A. D. Code, K. H. Nordsieck, C. M. Anderson, B. L. Babler, K. S. Bjorkman, G. C. Clayton, A. M. Magalhães, M. R. Meade, R. E. Schulte-Ladbeck, & B. A. Whitney.* 382, L85, 211-D5 (1991)

**Constellation Name: AO Cassiopeiae**

**A Spectroscopic Search for Colliding Stellar Winds in O-Type Close Binary Systems. I. AO Cassiopeiae.** *Douglas R. Gies & Michael S. Wigge.* 375, 321, 114-G10 (1991)

**Tomographic Separation of Composite Spectra: The Components of the O-Star Spectroscopic Binary AO Cassiopeiae.** *William G. Bagnuolo, Jr., & Douglas R. Gies.* 376, 266, 128-C1 (1991)

**Wind Collision Effects in the Early-Type Close Binaries HD 47129 and AO Cassiopeiae.** *Jorge Sahade & Estela Brandi.* 379, 706, 173-E1 (1991)

**Constellation Name: HT Cassiopeiae**

**Eclipse Studies of the Dwarf Nova HT Cassiopeiae. I. Observations and System Parameters.** *Keith Horne, Janet H. Wood, & Rae F. Stiening.* 378, 271, 154-C11 (1991)

**Constellation Name: SV Centauri**

**Does SV Centauri Harbor an Accretion Disk?** *Albert P. Linnell & Xania Scheick.* 379, 721, 173-F7 (1991)

**Constellation Name: V834 Centauri**

**X-Ray to Infrared Observations of the AM Herculis System E1405–451 (V834 Centauri).** *R. M. Sambruna, L. Chiappetti, A. Treves, J. M. Bonnet-Bidaud, P. Bouchet, L. Maraschi, C. Motch, & M. Mouchez.* 374, 744, 108-C10 (1991)

**High-Speed Multicolor Photometry of V834 Centaurus.** *John Middle ditch, James N. Imamura, Michael T. Wolff, & Thomas Y. Steiman-Cameron.* 382, 315, 204-B1 (1991)

**Constellation Name: DH Cephei**

**Circumstellar Material around the Massive Close Binary DH Cephei.** *M. F. Corcoran.* 366, 308, 4-G8 (1991)

**Constellation Name: U Cephei**

**Simultaneous Light and Radial Velocity Curve Solutions for U Cephei.** *J. B. Rafert & N. L. Markworth.* 377, 278, 141-D5 (1991)

**Constellation Name: ε Ceti**

**Distribution of Dust about ε Ceti and α Orionis Based on 11 Micron Spatial Interferometry.** *M. Bester, W. C. Danchi, C. G. Degiacomi, C. H. Townes, & T. R. Geballe.* 367, L27, 17-E1 (1991)

**Asymmetries in the Atmosphere of Mira.** *M. Karovska, P. Nisenson, C. Papaliolios, & R. P. Boyle.* 374, L51, 110-D1 (1991)

**Constellation Name: GP Comae Berenices**

**Evidence for CNO Processed Material in the Accretion Disk of GP Comae.** *T. R. Marsh, Keith Horne, & Simon Rosen.* 366, 535, 9-F1 (1991)

**Constellation Name: Cygnus X-1**

**Shot Model Parameters for Cygnus X-1 through Phase Portrait Fitting.** *James C. Lochner, J. H. Swank, & A. E. Szymkowiak.* 376, 295, 128-E9 (1991)

**SMM/HXRBS Observations of Cygnus X-1 from 1986 December to 1988 April.** *R. A. Schwartz, L. E. Orwig, B. R. Dennis, J. C. Ling, & W. A. Wheaton.* 376, 312, 128-G1 (1991)

**Constellation Name: Cygnus X-3**

**Problems of Ultra-High-Energy Particle Acceleration in Cygnus X-3: A Critical Reappraisal.** *Abhas Mirra.* 370, 345, 51-E7 (1991)

**Mayflower Mine 1500 GV Detector: Cosmic-Ray Anisotropy and Search for Cygnus X-3.** *D. J. Cutler & D. E. Groom.* 376, 322, 128-G12 (1991)

**Constellation Name: CG Cygni**

**A Connection between Long-Term Luminosity Variations and Orbital Period Changes in Chromospherically Active Binaries.** *Douglas S. Hall.* 380, L85, 188-F1 (1991)

**Constellation Name: P Cygni**

**First Ultraviolet Spectropolarimetry of Hot Supergiants.** *M. Taylor, A. D. Code, K. H. Nordsieck, C. M. Anderson, B. L. Babler, K. S. Bjorkman, G. C. Clayton, A. M. Magalhães, M. R. Meade, R. E. Schulte-Ladbeck, & B. A. Whitney.* 382, L85, 211-D5 (1991)

**Constellation Name: V404 Cygni**

**High-Speed Photometry of V404 Cygni in Outburst.** *Eric Gotthelf, Joseph Patterson, & Richard J. Stover.* 374, 340, 102-C11 (1991)

**Optical Identification of the X-Ray Source GS 2023+338 as V404 Cygni.** *R. Mark Wagner, Sumner G. Starrfield, Steve B. Howell, Tobias J. Kreidl, S. J. Bus, A. Cassatella, R. Bertram, & R. Fried.* 378, 293, 154-E10 (1991)

**Constellation Name: V1500 Cygni**

**Synchronization of the Magnetic Nova V1500 Cygni.** *Gary D. Schmidt & H. S. Stockman.* 371, 749, 70-G7 (1991)

**Constellation Name: YY Draconis**

**Near-Infrared Time-resolved Spectroscopy of the Cataclysmic Variable YY Draconis.** *Mario Mateo, Paula Szkody, & Peter Garnavich.* 370, 370, 51-G8 (1991)

**Constellation Name: λ Eridani**

**Circumstellar Material around λ Eridani (B2e). I. Geometry and Kinematics during 1987–1988.** *Myron A. Smith, Geraldine J. Peters, & C. A. Grady.* 367, 302, 15-G1 (1991)

**Constellation Name: EF Eridani**

**Bowen Fluorescence in AM Herculis Stars.** *Jonathan Schachter, Alexei V. Filippenko, Steven M. Kahn, & Frits B. S. Paerels.* 373, 633, 95-G4 (1991)

**Constellation Name: U Geminorum**

**A Study of the Ultraviolet Evolution of U Geminorum between Outbursts.** *Alan L. Kiplinger, Edward M. Sion, & Paula Szkody.* 366, 569, 10-B1 (1991)

**Constellation Name: Hercules X-1**

Phase Coherence for TeV/PeV Binary Sources. *D. A. Lewis, R. C. Lamb, & S. D. Biller.* 369, 479, 43-F4 (1991)

A Model for the 35 Day Variations in the Pulse Profile of Hercules X-1. *J. A. Peterson, R. E. Rothschild, & D. E. Gruber.* 378, 696, 161-A11 (1991)

A Model of Pulsed Gamma Radiation from the X-Ray Binary Hercules X-1/HZ Herculis. *F. A. Aharonian & A. M. Atoyan.* 381, 220, 191-F8 (1991)

Search for TeV Gamma-Ray Emission from Hercules X-1. *P. T. Reynolds, M. F. Cawley, D. J. Fegan, A. M. Hillas, P. W. Kwok, R. C. Lamb, M. J. Lang, D. A. Lewis, D. J. Macomb, K. S. O'Flaherty, G. Vacanti, & T. C. Weekes.* 382, 640, 209-E7 (1991)

Decrease in the Orbital Period of Hercules X-1. *John E. Deeter, Paul E. Boynton, Sigenori Miyamoto, Shunji Kitamoto, Fumiaki Nagase, & Nobuyuki Kawai.* 383, 324, 216-C1 (1991)

**Constellation Name: AM Herculis**

Possible Detection of TeV Gamma Rays from AM Herculis. *C. L. Bhat, R. K. Kaul, H. S. Rawat, V. K. Seneca, R. C. Rannat, M. L. Sapru, A. K. Tickoo, & H. Razdan.* 369, 475, 43-E12 (1991)

Bowen Fluorescence in AM Herculis Stars. *Jonathan Schachter, Alexei V. Filippenko, Steven M. Kahn, & Frits B. S. Paerels.* 373, 633, 95-G4 (1991)

**Constellation Name: DI Herculis**

On the Nature of the Anomalously Slow Apsidal Motion of DI Herculis. *Kh. F. Khaliullin, S. A. Khodykin, & A. I. Zakharov.* 375, 314, 114-G1 (1991)

**Constellation Name: HZ Herculis**

Search for TeV Gamma-Ray Emission from Hercules X-1. *P. T. Reynolds, M. F. Cawley, D. J. Fegan, A. M. Hillas, P. W. Kwok, R. C. Lamb, M. J. Lang, D. A. Lewis, D. J. Macomb, K. S. O'Flaherty, G. Vacanti, & T. C. Weekes.* 382, 640, 209-E7 (1991)

**Constellation Name: V795 Herculis**

V795 Herculis (=PG 1711+336), A Peculiar Intermediate Polar without Strong X-Ray Emission. *Erho Zhang, Edward L. Robinson, Tod F. Ramseier, Mathew D. Shetrone, & Rae F. Stiening.* 381, 534, 197-C10 (1991)

**Constellation Name: VW Hydri**

On the X-Ray-emitting Boundary Layer of the Dwarf Nova VW Hydri. *Christopher W. Mauche, Richard A. Wade, Ronald S. Polidan, Hans van der Woerd, & Frits B. S. Paerels.* 372, 659, 83-G7 (1991)

**Constellation Name: AD Leonis**

The Great Flare of 1985 April 12 on AD Leonis. *Suzanne L. Hawley & Bjørn R. Petersen.* 378, 725, 161-D1 (1991)

**Constellation Name: x Lupi**

First Results from the Goddard High-Resolution Spectrograph: High-Resolution Observations of the 1942 Å Resonance Line of Hg II in the Chemically Peculiar B Star, x Lupi. *David S. Leckrone, Glenn M. Wahlgren, & Sveneric G. Johansson.* 377, L37, 143-E1 (1991)

First Results from the Goddard High-Resolution Spectrograph: A Demonstration of Spectral Resolution and Experiments with Deconvolution. *Glenn M. Wahlgren, David S. Leckrone, Steven N. Shore, Don J. Lindler, Ronald L. Gilliland, & Dennis C. Ebbets.* 377, L41, 143-E6 (1991)

**Constellation Name: α Lyrae**

Metallic Line Profiles of the A0 V Star Vega. *Austin F. Gulliver, Saul J. Adelman, Charles R. Cowley, & J. Murray Fletcher.* 380, 223, 178-G1 (1991)

**Constellation Name: U Monocerotis**

Period Changes and Evolution in RV Tauri Stars. *John R. Percy, Dimitar D. Sasselov, Amy Alfred, & Greg Scott.* 375, 691, 121-C7 (1991)

**Constellation Name: ζ Ophiuchi**

Interstellar  $^{12}\text{C}/^{13}\text{C}$  Ratio Revisited. *Philippe Crane, Dennis J. Hegyi, & David L. Lambert.* 378, 181, 153-C1 (1991)

Interstellar Gas Phase Abundance of Carbon, Oxygen, Nitrogen, Copper, Gallium, Germanium, and Krypton toward ζ Ophiuchi. *Jason A. Cardelli, Blair D. Savage, & Dennis C. Ebbets.* 383, L23, 219-D1 (1991)

**Constellation Name: RS Ophiuchi**

Theoretical Light Curve for the Recurrent Nova RS Ophiuchi—Determination of the White Dwarf Mass, Composition, and Distance. *Mariko Kato.* 369, 471, 43-E6 (1991)

Is Drag Luminosity Effective in Recurrent Novae? *Mariko Kato & Izumi Hatchisu.* 373, 620, 95-F1 (1991)

**Constellation Name: α Orionis**

Distribution of Dust about α Ceti and α Orionis Based on 11 Micron Spatial Interferometry. *M. Bester, W. C. Danchi, C. G. Degiacomi, C. H. Townes, & T. R. Geballe.* 367, L27, 17-E1 (1991)

The Temperature of the Circumstellar Envelope of Alpha Orionis. *Bernadette Rodgers & Alfred E. Glassgold.* 382, 606, 209-B1 (1991)

**Constellation Name: FU Orionis**

On the Near-Infrared Spectrum of FU Orionis. *Nuria Calvet, Lee Hartmann, & Scott J. Kenyon.* 383, 752, 223-E6 (1991)

**Constellation Name: AG Pegasi**

AG Pegasi: A Multishell Radio Source. *H. T. Kenny, A. R. Taylor, & E. R. Seauquis.* 366, 549, 9-G7 (1991)

**Constellation Name: ζ Persei**

The Interstellar  $^{12}\text{CN}/^{13}\text{CN}$  Ratio toward ζ Persei. *Mary Elizabeth Kaiser, Isabel Hawkins, & Edward L. Wright.* 379, 267, 166-D1 (1991)

**Constellation Name: ε Persei**

First Results from the Goddard High-Resolution Spectrograph: Elemental Abundances as a Function of Velocity in the Neutral Gas toward ε Persei. *Blair D. Savage, Jason A. Cardelli, Frederick C. Bruhwiler, Andrew M. Smith, Dennis C. Ebbets, & Kenneth R. Sembach.* 377, L53, 143-F6 (1991)

First Results from the Goddard High-Resolution Spectrograph: Elemental Abundances in the Diffuse Clouds toward ε Persei. *Jason A. Cardelli, Blair D. Savage, Frederick C. Bruhwiler, Andrew M. Smith, Dennis C. Ebbets, Kenneth R. Sembach, & Ulysses J. Sofia.* 377, L57, 143-F11 (1991)

**Constellation Name: β Pictoris**

Mass Outflow in the Nearby Proto-Planetary System β Pictoris. *Frederick C. Bruhwiler, Yoji Kondo, & C. A. Grady.* 371, L27, 66-D7 (1991)

**Constellation Name: TX Piscium**

Dust Temperatures in the Circumstellar Shell of TX Piscium. *J. Wirsich.* 377, 285, 141-E1 (1991)

**Constellation Name: T Pyxidis**

Is Drag Luminosity Effective in Recurrent Novae? *Mariko Kato & Izumi Hatchisu.* 373, 620, 95-F1 (1991)

**Constellation Name: U Sagittae**

IUE Investigation of Mass Flow in the Interacting Binary U Sagittae. *George E. McCluskey, Jr., Carolina Pacienza Salas McCluskey, & Yoji Kondo.* 378, 281, 154-D9 (1991)

**Constellation Name: Scorpius X-1**

The Ultraviolet Spectrum of Scorpius X-1 as Observed by IUE: 1978–1988. *T. R. Kallman, J. C. Raymond, & S. D. Vrtilek.* 370, 717, 57-C11 (1991)

Observations of Scorpius X-1 with IUE: Ultraviolet Results from a Multiwavelength Campaign. *S. D. Vrtilek, W. Penninx, J. C. Raymond, F. Verbunt, P. Hertz, K. Wood, W. H. G. Lewin, & K. Mitsuda.* 376, 278, 128-D1 (1991)

The Radio “Lobes” of Scorpius X-1 Are Unrelated Background Sources. *E. B. Fomalont & B. J. Geldzahler.* 383, 289, 215-G1 (1991)

**Constellation Name: π Scorpri**

Ultraviolet Interstellar Lines in the Spectrum of π Scorpri Recorded at 2 Kilometers per Second Resolution. *Charles L. Joseph & Edward B. Jenkins.* 368, 201, 25-E9 (1991)

**Constellation Name: U Scorpri**

Is Drag Luminosity Effective in Recurrent Novae? *Mariko Kato & Izumi Hatchisu.* 373, 620, 95-F1 (1991)

**Constellation Name: V926 Scorpii**

A Study of the Hα Line in X1735–444. *Alan P. Smale & Robin H. D. Corbet.* 383, 853, 224-G6 (1991)

**Constellation Name: R Scuti**

Period Changes and Evolution in RV Tauri Stars. *John R. Percy, Dimitar D. Sasselov, Amy Alfred, & Greg Scott.* 375, 691, 121-C7 (1991)

**Constellation Name: NN Serpentis**

IUE Spectra of the Eclipsing Binary NN Serpentis. *Janet H. Wood & Thomas R. Marsh.* 381, 551, 197-E1 (1991)

**Constellation Name: α Tauri**

First Results from the Goddard High-Resolution Spectrograph: The Chromosphere of α Tauri. *Kenneth G. Carpenter, Richard D. Robinson, Glenn M. Wahlgren, Thomas B. Ake, Dennis C. Ebbets, Jeffrey L. Linsky, Alexander Brown, & Frederick M. Walter.* 377, L45, 143-E11 (1991)

First Ultraviolet Spectropolarimetry of Be Stars from the Wisconsin Ultraviolet Photo-Polarimeter Experiment. *K. S. Bjorkman, K. H. Nordseick, A. D. Code, C. M. Anderson, B. L. Babler, G. C. Clayton, A. M. Magalhães, M. R. Meade, M. A. Nook, R. E. Schulte-Ladbeck, M. Taylor, & B. A. Whitney.* 383, L67, 226-E1 (1991)

**Constellation Name: ζ Tauri**

First Ultraviolet Spectropolarimetry of Be Stars from the Wisconsin Ultraviolet Photo-Polarimeter Experiment. *K. S. Bjorkman, K. H. Nordseick, A. D. Code, C. M. Anderson, B. L. Babler, G. C. Clayton, A. M. Magalhães, M. R. Meade, M. A. Nook, R. E. Schulte-Ladbeck, M. Taylor, & B. A. Whitney.* 383, L67, 226-E1 (1991)

**Constellation Name: BP Tauri**

The Lithium Abundance of the T Tauri Star BP Tauri. *Douglas K. Duncan.* 373, 250, 89-B1 (1991)

**Constellation Name: V471 Tauri**

Inefficient Accretion by the DA2 White Dwarf in V471 Tauri. *D. J. Mullan, H. L. Shipman, E. M. Sion, & J. MacDonald.* 374, 707, 107-G8 (1991)

Evidence for External Plasma around the K Dwarf Component of the Eclipsing Binary V471 Tauri. *Arthur Young, Lee Rotter, & Andrew Skumanich.* 378, L25, 157-D1 (1991)

**Constellation Name: KX Trianguli Australis**

The Ultraviolet Spectrum of KX Trianguli Australis. *Walter A. Feibelman.* 375, 335, 115-A12 (1991)

**Constellation Name: W Ursae Majoris**

A Light Synthesis Study of W Ursae Majoris. *Albert P. Linnell.* 374, 307, 102-A1 (1991)

The Ultraviolet Light Curves of W Ursae Majoris. *Albert P. Linnell.* 379, 338, 167-C3 (1991)

A Test of the Starspot Hypothesis for W-Type W Ursae Majoris Light Curves. *Albert P. Linnell.* 383, 330, 216-C8 (1991)

**Constellation Name: KO Velorum**

A New Candidate Orbital Period for KO Velorum (E1013-477). *K. Mukai & R. H. D. Corbet.* 378, 701, 161-B3 (1991)

**Constellation Name: IX Velorum**

High-Resolution IUE Spectra of the Nova-like Variable IX Velorum. *Christopher W. Mauche.* 373, 624, 95-F7 (1991)

**Constellation Name: PW Vulpeculae**

PW Vulpeculae: A Nova with Nearly Solar Abundances. *Pedro Saizar, Summer Starrfield, Gary J. Ferland, R. Mark Wagner, James W. Truran, Scott J. Kenyon, Warren M. Sparks, Robert E. Williams, & L. L. Stryker.* 367, 310, 15-G11 (1991)

**Bright Star Number: HR 10**

A Search for Circumstellar Dust around HR 10, a Proposed β Pictoris Star. *Kwang-Ping Cheng, C. A. Grady, & Frederick C. Bruhweiler.* 366, L87, 11-E7 (1991)

**Henry Draper Number: HD 29647**

Diffuse Band Profiles in the Spectrum of HD 29647: Evidence for a Molecular Origin? *Theodore P. Snow & C. G. Seab.* 382, 189, 202-E7 (1991)

**Henry Draper Number: HD 34656**

Detection of Small-Amplitude Pulsations in HD 34656 (O7 II). *A. W. Fullerton, D. R. Gies, & C. T. Bolton.* 368, L35, 35-C1 (1991)

**Henry Draper Number: HD 35155**

An Interactive Companion to the S Star HD 35155. *Thomas B. Ake III, Hollis R. Johnson, & Mudhaffer M. Ameen.* 383, 842, 224-F7 (1991)

**Henry Draper Number: HD 38218**

The Mid-Infrared Spectrum of the Carbon Star HD 38218 and Its Possible Relation to Polycyclic Aromatic Hydrocarbons. *Richard H. Buss, Jr., A. G. G. M. Tielens, & Theodore P. Snow.* 372, 281, 77-D8 (1991)

**Henry Draper Number: HD 39060**

First Results from the Goddard High-Resolution Spectrograph: Resolved Velocity and Density Structure in the β Pictoris Circumstellar Gas. *A. Bogess, Frederick C. Bruhweiler, C. A. Grady, Dennis C. Ebbets, Yoji Kondo, L. M. Trafton, John C. Brandt, & S. R. Heap.* 377, L49, 143-F1 (1991)

**Henry Draper Number: HD 47129**

Wind Collision Effects in the Early-Type Close Binaries HD 47129 and AO Cassiopeiae. *Jorge Sahade & Estela Brandt.* 379, 706, 173-E1 (1991)

**Henry Draper Number: HD 50896**

HD 50896: Blobs in a Wind with a Collapsed Companion or Rotating Disk with Central Filaments? *Anne B. Underhill & Stephenson Yang.* 368, 588, 32-D9 (1991)

**Henry Draper Number: HD 72088**

Evidence for a Thermally Unstable Shock Wave in the Vela Supernova Remnant. *John C. Raymond, George Wallerstein, & Bruce Balick.* 383, 226, 214-G5 (1991)

**Henry Draper Number: HD 72127**

Variable Interstellar Absorption toward HD 72127A. II. 1981-1988. *L. M. Hobbs, R. Ferlet, D. E. Welty, & G. Wallerstein.* 378, 586, 159-F1 (1991)

**Henry Draper Number: HD 140283**

First Detection of Beryllium in a Very Metal Poor Star: A Test of the Standard Big Bang Model. *Gerard Gilmore, Bengt Edvardsson, & P. E. Nissen.* 378, 17, 151-C1 (1991)

**Henry Draper Number: HD 135345**

A Cool Supergiant with Anomalous Behavior of the 2800 Mg II Doublet. *G. A. Gurzadyan, Y. Kondo, S. S. Rustambekyan, Yervant Terzian, & Mario R. Perez.* 378, 298, 154-F1 (1991)

**Henry Draper Number: HD 156359**

Ultraviolet Interstellar Absorption toward HD 156359, a Halo Star at 11 Kiloparsecs in the Direction  $l = 329^\circ$  and  $b = -15^\circ$ . *Kenneth R. Sembach, Blair D. Savage, & Derck Massa.* 372, 81, 75-A11 (1991)

**Henry Draper Number: HD 183143**

The Diffuse Interstellar Bands. VIII. New Features between 6000 and 8650 Å. *G. H. Herbig & K. D. Leka.* 382, 193, 202-E12 (1991)

**Henry Draper Number: HDE 269227**

Non-LTE Analysis of the Ofpe/WN9 Star HDE 269227 (R84). *Werner Schmutz, Claus Leitherer, Ivan Hubeny, Manfred Vogel, Wolf-Rainer Hamann, & Ulf Wesselowski.* 372, 664, 84-A1 (1991)

**Henry Draper Number: HDE 311884**

Ultraviolet Variability of the Massive W-R Binary System HDE 311884 = WR 47. *Gloria Koenigsberger, Anthony F. J. Moffat, & Lawrence H. Auer.* 376, 272, 128-C9 (1991)

**Name: Geminga**

Locating Very High Energy Gamma-Ray Sources with Arcminute Accuracy. *C. W. Akerlof, M. F. Cawley, M. Chantell, D. J. Fegan, K. Harris, A. M. Hillas, D. G. Jennings, R. C. Lamb, M. A. Lawrence, M. J. Lang, D. A. Lewis, D. I. Meyer, G. Mohanty, K. S. O'Flaherty, M. Punch, P. T. Reynolds, M. S. Schubnell, T. C. Weekes, & T. Whitaker.* 377, L97, 150-E6 (1991)

**Name: HH 46 IRS**

A Nearly Unipolar CO Outflow from the HH 46-47 System. *Lawrence M. Chernin & Colin R. Masson.* 382, L93, 211-E3 (1991)

**Name: Melnick 42**

First Results from the Goddard High-Resolution Spectrograph: Spectroscopic Determination of Stellar Parameters of Melnick 42, an O3f Star in the Large Magellanic Cloud. *S. R. Heap, B. Altner, D. Ebbets, I. Hubeny, J. B. Hutchings, R. P. Kudritzki, S. A. Voels, S. Haser, A. Paudlach, J. Puls, & K. Butler.* 377, L29, 143-D6 (1991)

First Results from the Goddard High-Resolution Spectrograph: Evidence for Photospheric Microturbulence in Early O Stars: Are Surface Gravities Systematically Underestimated? *I. Hubeny, S. R. Heap, & B. Altner.* 377, L33, 143-D11 (1991)

**Alphanumeric: A0535+26**

Accretion Mechanisms in the Be/X-Ray Transient System A0535+26. *C. Motch, L. Stella, E. Janot-Pacheco, & M. Mouchet.* 369, 490, 43-G5 (1991)

**Alphanumeric: ADS 11300**

Binary Star Observations with the *Hubble Space Telescope* Fine Guidance Sensors. I. ADS 11300. *O. G. Franz, T. J. N. Kreidl, L. W. Wasserman, A. J. Bradley, G. F. Benedict, P. D. Hemenway, W. H. Jefferys, B. McArthur, J. E. McCartney, E. Nelan, P. J. Shelus, D. Story, A. L. Whipple, R. L. Duncombe, L. W. Fredrick, & Wm. F. van Altena.* 377, L17, 143-C6 (1991)

**Alphanumeric: 3A 0729+103**

Spin-up of the White Dwarf in the Intermediate Polar 3A 0729+103. *Jyoti Singh, P. C. Agrawal, K. M. V. Apparao, P. Vivekananda Rao, & M. B. K. Sarma.* 380, 208, 178-E11 (1991)

**Alphanumeric: BD +28°4211**

Absolute Far-Ultraviolet Spectrophotometry of Hot Subluminous Stars from *Voyager*. *J. B. Holberg, B. Ali, T. E. Carone, & R. S. Polidan.* 375, 716, 121-E11 (1991)

**Alphanumeric: BD +75°325**

First Results from the Goddard High-Resolution Spectrograph: Evidence for Photospheric Microturbulence in Early O Stars: Are Surface Gravities Systematically Underestimated? *I. Hubeny, S. R. Heap, & B. Aliner.* 377, L33, 143-D11 (1991)

**Alphanumeric: CD -41°13967**

Echelle Spectroscopy of CD -41° 13967: The Young Central Star of a New Planetary Nebula. *James K. McCarthy, R. Michael Rich, S. R. Becker, K. Butler, D. Husfeld, & H. G. Groth.* 371, 380, 64-G1 (1991)

**Alphanumeric: 2CG 006-00**

No Evidence for TeV Gamma Radiation from 2CG 006-00. *H. I. Nel, B. C. Raubenheimer, O. C. de Jager, R. Buccieri, M. Busetta, A. R. North, & C. Brink.* 368, 585, 32-D4 (1991)

**Alphanumeric: DD 13**

DD 13: A Very Young and Heavily Reddened Early O Star in the Large Magellanic Cloud. *Peter S. Conti & Edward L. Fitzpatrick.* 373, 100, 87-C5 (1991)

**Alphanumeric: 1E 1751+7046**

Nonthermal Radio Emission from the X-Ray-Bright K5 IV Star 1E 1751+7046. *Stephen L. Skinner.* 368, 272, 26-D11 (1991)

**Alphanumeric: 1E 2259+586**

Phase Coherence for TeV/PeV Binary Sources. *D. A. Lewis, R. C. Lamb, & S. D. Biller.* 369, 479, 43-F4 (1991)

**Alphanumeric: ESO 207-61**

ESO 207-61: A Brown Dwarf Candidate in the Hyades Moving Group. *Maria Teresa Ruiz, Marianne Y. Takamiya, & Miguel Roth.* 367, L59, 22-C7 (1991)

**Alphanumeric: EXO 0748-676**

The Orbital Ephemeris and Eclipse Transitions of the Low-Mass X-Ray Binary EXO 0748-676. *A. N. Parmar, A. P. Smale, F. Verbunt, & R. H. D. Corbet.* 366, 253, 4-B9 (1991)

**Alphanumeric: EXO 2030+375**

Flares in the X-Ray Source EXO 2030+375. *Krishna M. V. Apparao.* 375, 701, 121-D7 (1991)

**Alphanumeric: G29-38**

The Infrared and Optical Pulsations of G29-38. *Joseph Patterson, B. Zuckerman, E. E. Becklin, D. J. Tholen, & T. Hawarden.* 374, 330, 102-C1 (1991)

**Alphanumeric: G191-B2B**

Absolute Far-Ultraviolet Spectrophotometry of Hot Subluminous Stars from *Voyager*. *J. B. Holberg, B. Ali, T. E. Carone, & R. S. Polidan.* 375, 716, 121-E11 (1991)

**Alphanumeric: GD 50**

The Isolated Massive DA White Dwarf GD 50. *P. Bergeron, K. M. Kidder, J. B. Holberg, James Liebert, F. Wesemael, & Rex A. Saffer.* 372, 267, 77-C5 (1991)

**Alphanumeric: GD 358**

A Critical Analysis of the Ultraviolet Temperature Scale of the Helium-dominated DB and DBV White Dwarfs. *Peter Thejll, Stéphane Vennes, & Harry L. Shipman.* 370, 355, 51-F5 (1991)

**Alphanumeric: GL 490**

Aperture Synthesis CS(2-1) Observations of a Young Stellar Object GL 490: Accretion Flow in Gas Disk. *Akiko Nakamura, Ryohi Kawabe, Yoshimi Kitamura, Masato Ishiguro, Yasuhiro Murata, & Nagayoshi Ohashi.* 383, L81, 226-F5 (1991)

**Alphanumeric: GRW +70°8247**

Thomson Scattering in a Magnetic Field. II. Arbitrary Field Orientation. *Barbara A. Whitney.* 369, 451, 43-C10 (1991)

**Alphanumeric: GX 301-2**

The X-Ray Properties of GX 301-2 (4U 1223-62). *F. Haberl.* 376, 245, 128-A5 (1991)

**Alphanumeric: GX 339-4**

A Jet Model for a Very High State of GX 339-4. *Sigenori Miyamoto & Shunji Kitamoto.* 374, 741, 108-C6 (1991)

X-Ray Variability of GX 339-4 in Its Very High State. *Sigenori Miyamoto, Kazuhiro Kimura, Shunji Kitamoto, Tadayasu Dotani, & Ken Ebisawa.* 383, 784, 224-A3 (1991)

**Alphanumeric: H0538+608**

Ginga Observation of an AM Herculis Type Source H0538+608. *M. Ishida, A. Silber, H. V. Bradt, R. A. Remillard, K. Makishima, & T. Ohashi.* 367, 270, 15-D6 (1991)

**Alphanumeric: H1907+690**

The Eclipsing AM Herculis Variable H1907+690. *R. A. Remillard, B. A. Stroozas, S. Tapia, & A. Silber.* 379, 715, 173-E13 (1991)

**Alphanumeric: IRAS 17380-3031**

IRAS 17380-3031: A New Dusty Late WC-Type Wolf-Rayet Star. *Martin Cohen, K. A. van der Hucht, P. M. Williams, & P. S. Thé.* 378, 302, 154-F7 (1991)

**Alphanumeric: IRC +10216**

CN and HCN in the Infrared Spectrum of IRC +10216. *G. R. Wiedemann, Kenneth H. Hinkle, John J. Keady, D. Deming, & D. E. Jennings.* 382, 321, 204-B10 (1991)

**Alphanumeric: IRS 7**

A Gaseous Tail Ablated from the Supergiant IRS 7 near the Galactic Center. *E. Serabyn, J. H. Lacy, & J. M. Achtermann.* 378, 557, 159-C9 (1991)

**Alphanumeric: LB 1497**

Gravitational Redshift for the Pleiad White Dwarf LB 1497. *Gary Wegner, I. Neill Reid, & Robert K. McMahan, Jr.* 376, 186, 127-C6 (1991)

**Alphanumeric: LkHα 101**

The LkHα 101 Infrared Cluster. *M. Barsony, J. M. Schombert, & K. Kis-Halas.* 379, 221, 165-G1 (1991)

The 1.0-1.3 Micron Spectrum of LkHα 101. *Richard J. Rudy, Peter Erwin, George S. Rossano, & R. C. Puett.* 383, 344, 216-D7 (1991)

**Alphanumeric: LMC X-3**

Discovery of a Long-Term Periodic Variation in LMC X-3. *A. P. Cowley, P. C. Schmidtke, K. Ebisawa, F. Makino, R. A. Remillard, D. Crampton, J. B. Hutchings, S. Kitamoto, & A. Treves.* 381, 526, 197-C1 (1991)

**Alphanumeric: MWC 560**

Observations of the Peculiar Object MWC 560 in Outburst. *A. G. Michalitsianos, S. P. Maran, R. J. Oliverson, B. Bopp, E. Kontizas, A. Dapergolas, & M. Kontizas.* 371, 761, 71-A7 (1991)

**Alphanumeric: NGC 7538 IRS 9**

An Extremely High Velocity CO Outflow from NGC 7538 IRS 9. *George F. Mitchell & Tatsuhiko I. Hasegawa.* 371, L33, 66-E1 (1991)

**Alphanumeric: PG 1159-035**

Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope. *D. E. Winget, R. E. Nather, J. C. Clemens, J. Provencal, S. J. Kleinman, P. A. Bradley, M. A. Wood, C. F. Claver, M. L. Frueh, A. D. Grauer, B. P. Hine, C. J. Hansen, G. Fontaine, N. Achilleos, D. T. Wickramasinghe, T. M. K. Marar, S. Seetha, B. N. Ashoka, D. O'Donoghue, B. Warner, D. W. Kurtz, D. A. Buckley, J. Brickhill, G. Vauclair, N. Dolez, M. Chevreton, M. A. Barstow, J. E.*

- Solheim, A. Kanaan, S. O. Kepler, G. W. Henry, & S. D. Kawaler.* 378, 326, 155-A10 (1991)
- Alphanumeric: PSR 0656+14**
- The Proper Motion of the Soft X-Ray-emitting Radio Pulsar PSR 0656+14. *R. J. Thompson, Jr., F. A. Córdova, R. M. Hjellming, & E. B. Fomalont.* 366, L83, 11-E1 (1991)
- Alphanumeric: PSR 0833-45**
- Explosion of a Rotating Neutron Star near the Minimum Mass. *Monica Colpi, Stuart L. Shapiro, & Saul A. Teukolsky.* 369, 422, 43-A5 (1991)
- HEAO 3* Upper Limits to Pulsed Gamma-Ray Emission from PSR 1509-58 and PSR 0833-45. *M. P. Ulmer, W. R. Purcell, W. A. Wheaton, & W. A. Mahoney.* 369, 485, 43-F12 (1991)
- Alphanumeric: PSR 1509-58**
- HEAO 3* Upper Limits to Pulsed Gamma-Ray Emission from PSR 1509-58 and PSR 0833-45. *M. P. Ulmer, W. R. Purcell, W. A. Wheaton, & W. A. Mahoney.* 369, 485, 43-F12 (1991)
- Alphanumeric: PSR 1744-24A**
- Mechanisms for Pulsar Eclipse. *David Eichler.* 370, L27, 53-D11 (1991)
- On the Nature and Evolution of the Windy Binary Pulsar PSR 1744-24A. *Jacob Shaham & Marco Tavani.* 377, 588, 147-A11 (1991)
- Alphanumeric: PSR 1855+09**
- High-Precision Timing of Millisecond Pulsars. I. Astrometry and Masses of the PSR 1855+09 System. *M. F. Ryba & J. H. Taylor.* 371, 739, 70-F9 (1991)
- Alphanumeric: PSR 1937+21**
- Refractive Interstellar Scintillation and Millisecond Pulsar Timing. *Wayne Hu, Roger W. Romani, & Daniel R. Stinebring.* 366, L33, 6-D9 (1991)
- Alphanumeric: PSR 1957+20**
- Mechanisms for Pulsar Eclipse. *David Eichler.* 370, L27, 53-D11 (1991)
- High-Precision Timing of Millisecond Pulsars. II. Astrometry, Orbital Evolution, and Eclipses of PSR 1957+20. *M. F. Ryba & J. H. Taylor.* 380, 557, 185-B7 (1991)
- Alphanumeric: 2S 0114+65**
- EXOSAT Observations of the X-Ray Source 2S 0114+65.* *Krishna M. V. Apparao, P. Bish, & K. P. Singh.* 371, 772, 71-B6 (1991)
- Alphanumeric: SMC X-1**
- The Discovery of an X-Ray Burst and a Study of Aperiodic Variability from SMC X-1. *L. Angelini, L. Stella, & N. E. White.* 371, 332, 64-C1 (1991)
- Alphanumeric: SN 1979C**
- The 10 Year Radio Light Curves for SN 1979C. *Kurt W. Weiler, Schuyler D. Van Dyk, Nino Panagia, Richard A. Sramek, & Jennifer L. Discenna.* 380, 161, 178-B1 (1991)
- Alphanumeric: SN 1984L**
- The Late-Time Light Curve of SN 1984L. *Douglas A. Swartz & J. Craig Wheeler.* 379, L13, 169-B7 (1991)
- Alphanumeric: SN 1987A**
- Instabilities and Clumping in SN 1987A. I. Early Evolution in Two Dimensions. *Bruce Fryxell, Ewald Müller, & David Arnett.* 367, 619, 21-A5 (1991)
- First Results from the Faint Object Camera: SN 1987A. *P. Jakobsen, R. Albrecht, C. Barbieri, J. C. Blades, A. Boksenberg, P. Crane, J. M. Deharveng, M. J. Disney, T. M. Kamperman, I. R. King, F. Macchietto, C. D. Mackay, F. Paresce, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, W. B. Sparks, R. P. Kirshner, & N. Panagia.* 369, L63, 46-B1 (1991)
- A Large Supershell H II Region Complex in the Large Magellanic Cloud and the Interstellar Environment of SN 1987A. *Frederick C. Bruhweiler, Michelle A. Fitzurka, & Theodore R. Gull.* 370, 551, 55-C9 (1991)
- Bremstrahlung and Energetic Electrons in Supernovae. *Donald D. Clayton & Lih-Sin The.* 375, 221, 113-F12 (1991)
- Analysis of SN 1987A Polarimetry. *David J. Jeffery.* 375, 264, 114-C5 (1991)
- Properties of the SN 1987A Circumstellar Ring and the Distance to the Large Magellanic Cloud. *N. Panagia, R. Gilmozzi, F. Macchietto, H.-M. Adorf, & R. P. Kirshner.* 380, L23, 181-D1 (1991)
- Circumstellar Emission from SN 1987A. *Peter Lundqvist & Claes Fransson.* 380, 575, 185-D1 (1991)
- Catalog of SN 1987A Polarimetry Corrected for Interstellar Polarization. *David J. Jeffery.* 77, 405, 50-B5 (1991)
- Rayleigh-Taylor Instability in the Asymmetric Supernova Explosion. *Shoichi Yamada & Katsuhiko Sato.* 382, 594, 208-G12 (1991)
- Massive Star Evolution and SN 1987A. *David Arnett.* 383, 295, 215-G8 (1991)
- Alphanumeric: SN 1988A**
- SN 1988A in M58: Departure from  $^{56}\text{Co}$  Decay 700 Days after Explosion. *P. Ruiz-Lapuente, M. Kidger, G. Gómez, R. Canal, & R. López.* 378, L41, 162-E1 (1991)
- Alphanumeric: SN 1990N**
- Premaximum Observations of the Type Ia SN 1990N. *Bruno Leibundgut, Robert P. Kirshner, Alexei V. Filippenko, Joseph C. Shields, Craig B. Foltz, Mark M. Phillips, & George Sonnenborn.* 371, L23, 66-D1 (1991)
- Alphanumeric: SS 433**
- Magnetic Focusing of Precessing Jets. *Christopher S. Kochanek.* 371, 289, 63-F7 (1991)
- Constraints on the Physical Properties of Optical Bullets in SS 433. *John C. Brown, Joseph P. Cassinelli, & George W. Collins II.* 378, 307, 154-G1 (1991)
- Alphanumeric: SVS 13**
- An Optical/Infrared Outburst in the Exciting Source of HH 7-11. *Jochen Eisloffel, Eike Günther, Frederic V. Hessman, Reinhard Mundt, Ralf Poetzel, John S. Carr, Steven Beckwith, & Tom P. Ray.* 383, L19, 219-C7 (1991)
- Alphanumeric: 4U 0115+63**
- Phase Coherence for TeV/PeV Binary Sources. *D. A. Lewis, R. C. Lamb, & S. D. Biller.* 369, 479, 43-F4 (1991)
- Search for TeV Emission from 4U 0115+63. *D. J. Macomb, M. F. Cowley, D. J. Fegan, A. M. Hillas, P. W. Kwok, R. C. Lamb, M. J. Lang, D. A. Lewis, P. T. Reynolds, G. Vacanti, & T. C. Weekes.* 376, 738, 135-D12 (1991)
- Alphanumeric: 4U 1538-52**
- Multimission Observations of 4U 1538-52. *L. R. Cominsky & F. Moraes.* 370, 670, 56-F10 (1991)
- Alphanumeric: X1323-619**
- Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2. *D. Barret, S. Mereghetti, J. P. Roques, P. Mandrou, L. Salotti, F. Lebrun, Ph. Laurent, J. Ballet, E. Churazov, M. Gisyanov, R. Sunyaev, N. Khavenson, I. Chulkov, B. Novikov, A. Kuznetsov, & A. Dyachkov.* 379, L21, 169-C1 (1991)
- STARS: INTERIORS**
- Application of Oxygen-enhanced Evolutionary Sequences to the Horizontal Branch of M15. *Ben Dorman, Young-Wook Lee, & Don A. VandenBerg.* 366, 115, 2-D11 (1991)
- Mixing Length and Opacity Effects: Deep Convective Envelopes on the Asymptotic Giant Branch. *I. Julianne Sackmann & Arnold I. Boothroyd.* 366, 529, 9-E7 (1991)
- Evolutionary Models of Halo Stars with Rotation. I. Evidence for Differential Rotation with Depth in Stars. *Marc H. Pinsonneault, Constantine P. Deliyannis, & Pierre Demarque.* 367, 239, 15-A12 (1991)
- Cold Nuclear Fusion in Dense Metallic Hydrogen. *Charles J. Horowitz.* 367, 288, 15-E13 (1991)
- Adiabatic Properties of Pulsating DA White Dwarfs. I. The Treatment of the Brunt-Väisälä Frequency and the Region of Period Formation. *P. Brassard, G. Fontaine, F. Wesemael, S. D. Kawaler, & M. Tassoul.* 367, 601, 20-F11 (1991)
- Instabilities and Clumping in SN 1987A. I. Early Evolution in Two Dimensions. *Bruce Fryxell, Ewald Müller, & David Arnett.* 367, 619, 21-A5 (1991)
- Neutron Star Thermal Evolution. *Kenneth A. Van Riper.* 75, 449, 6-G7 (1991)
- Asteroseismology of White Dwarf Stars. I. Adiabatic Results. *P. A. Bradley & D. E. Winget.* 75, 463, 7-A13 (1991)
- Numerical Simulations of Off-Center Detonations in Helium Shells. *Eli Livne & Ami S. Glasner.* 370, 272, 50-E12 (1991)

- Turbulent Compressible Convection. *Fausto Cattaneo, Nicholas H. Brummell, Juri Toomre, Andrea Malagoli, & Neal E. Hurlbut.* 370, 282, 50-F10 (1991)
- Stellar Turbulent Convection: A New Model and Applications. *V. M. Canuto & I. Mazzitelli.* 370, 295, 51-A1 (1991)
- Helium Star Cataclysmics. *Icko Iben, Jr., & Alexander V. Tutukov.* 370, 615, 56-B5 (1991)
- Meridional Circulation and Diffusion in A and Early F Stars. *Paul Charbonneau & Georges Michaud.* 370, 693, 57-A10 (1991)
- Lithium in the Most Extreme Halo Stars; Trends with Metallicity. *Constantine P. Deliyannis & Pierre Demarque.* 370, L89, 59-E5 (1991)
- He Stars and He-accreting CO White Dwarfs. *Marco Limongi & Amède Tornambé.* 371, 317, 64-A9 (1991)
- Carbon Isotope Ratios along the Giant Branch of M67. *Kalpana Krishnaswamy Gibroy & Jeffery A. Brown.* 371, 578, 68-F7 (1991)
- Diffusion and Mixing of Lithium and Helium in Population II Dwarfs. *Charles R. Proffitt & Georges Michaud.* 371, 584, 68-G1 (1991)
- The Shock Process and Light-Element Production in Supernova Envelopes. *Lawrence E. Brown, David S. Dearborn, David N. Schramm, Jon T. Larsen, & Shin Kurokawa.* 371, 648, 69-F1 (1991)
- $\alpha$ -Process Nucleosynthesis in Massive Stars and the Weak Component. II. Carbon Burning and Galactic Enrichment. *C. M. Raiteri, M. Busso, R. Gallino, & G. Picchio.* 371, 665, 69-G6 (1991)
- How Much Hydrogen Is There in a White Dwarf? *James MacDonald & Stéphane Vennes.* 371, 719, 70-E1 (1991)
- White Dwarf and Neutron Star Interior Solutions in the Nonsymmetric Gravitational Theory. *L. M. Campbell, J. W. Moffat, & P. Savaria.* 372, 241, 77-A1 (1991)
- Steady State Energy Sources in Neutron Stars. *Kenneth A. Van Riper.* 372, 251, 77-A13 (1991)
- The Isolated Massive DA White Dwarf GD 50. *P. Bergeron, K. M. Kidder, J. B. Holberg, James Liebert, F. Wesemael, & Rex A. Saffer.* 372, 267, 77-C5 (1991)
- Qualitative Explanations of Red Giant Formation. *R. Bhaskar & Anil Nigam.* 372, 592, 83-A10 (1991)
- The Lithium Abundance of M67 Blue Stragglers: A Constraint on the Blue Straggler Phenomenon. *C. J. Pritchett & J. W. Glaspey.* 373, 105, 87-C12 (1991)
- Analysis of Radiation Pressure Effects in Pulsating Stars through Perturbative Limit Cycle Solutions. *A. Costa, D. Gómez, & C. Ferro Fontán.* 373, 237, 88-G13 (1991)
- Double Core Evolution. IV. The Late Stages of Evolution of a  $2 M_{\odot}$  Red Giant with a  $1 M_{\odot}$  Companion. *Ronald E. Taam & Peter Bodenheimer.* 373, 246, 89-A10 (1991)
- Single and Binary Star Evolution. *Icko Iben, Jr.* 76, 55, 24-G3 (1991)
- Stellar Evolutionary Models from the Zero-Age Main Sequence to the First Thermal Pulse. *John C. Lattanzio.* 76, 215, 27-B9 (1991)
- Structure and Stability of Rotating Relativistic Neutron Stars. *F. Weber, N. K. Glendenning & M. K. Weigel.* 373, 579, 95-B10 (1991)
- Ionization by High-Energy Particles and the Electron Scattering Opacity in Supernovae. *Douglas A. Swartz.* 373, 604, 95-D11 (1991)
- Model Light Curves of Linear Type II Supernovae. *Douglas A. Swartz, J. Craig Wheeler, & Robert P. Harkness.* 374, 266, 101-D7 (1991)
- Blue Loops during Core Helium Burning as the Consequence of Moderate Convective Envelope Overshooting in Stars of Intermediate to High Mass. *Richard B. Stothers & Chao-wen Chin.* 374, 288, 101-F3 (1991)
- Shell Helium Burning in Low-Mass Stars. I. Models in Thermal Equilibrium. *Masayuki Y. Fujimoto & Icko Iben, Jr.* 374, 631, 107-A1 (1991)
- Thermonuclear Reactions in Dense Stellar Matter: Electron Screening Revisited. *Setsuo Ichimaru & Shuji Ogata.* 374, 647, 107-B5 (1991)
- Hydrodynamic Pulsation Models of Yellow Supergiant Stars in the Post-Asymptotic Giant Branch. *Toshiki Aikawa.* 374, 700, 107-F13 (1991)
- The Stretching of Magnetic Flux Tubes in the Convective Overshoot Region. *George H. Fisher, Alexander N. McClymont, & Dean-Yi Chou.* 374, 766, 108-E10 (1991)
- Isochrones for H-burning Globular Cluster Stars. II. The Metallicity Range  $-2.3 < [\text{Fe}/\text{H}] < -0.5$ . *Oscar Straniero & Alessandro Chieffi.* 76, 525, 32-D1 (1991)
- The Evolution of Intermediate-Mass Protostars. I. Basic Results. *Francesco Palla & Steven W. Stahler.* 375, 288, 114-E1 (1991)
- Rotational Evolution of Solar-Type Stars. I. Main-Sequence Evolution. *K. B. MacGregor & M. Brenner.* 376, 204, 127-D13 (1991)
- The Effects of Thermal Radiation on Some General Relativistic Stellar Models. *J. M. Aguirregabiria, J. Ibáñez, A. Di Prisco, & L. Herrera.* 376, 662, 134-E8 (1991)
- The RRD Masses Revisited. *Norman R. Simon & Arthur N. Cox.* 376, 717, 135-C1 (1991)
- Li Depletion in F Stars by Internal Gravity Waves. *Ramón J. García López & Hendrik C. Spruit.* 377, 268, 141-C7 (1991)
- Lithium Abundances in Carbon Stars. *Gran R. Denn, R. Earle Luck, & David L. Lambert.* 377, 657, 147-G5 (1991)
- Neutrino-heated Stars and Broad-Line Emission from Active Galactic Nuclei. *James MacDonald, Todor Stanev, & Peter L. Biermann.* 378, 30, 151-D4 (1991)
- Discovery and Seismological Interpretation of Low-Amplitude Modes in the Pulsating DO White Dwarf PG 1707+427 (V817 Herculis). *G. Fontaine, P. Bergeron, G. Vauclair, P. Brassard, F. Wesemael, S. D. Kawaler, A. D. Grauer, & D. E. Winget.* 378, L49, 162-F1 (1991)
- Lithium in Halo Stars: Constraining the Effects of Helium Diffusion on Globular Cluster Ages and Cosmology. *Constantine P. Deliyannis & Pierre Demarque.* 379, 216, 165-F7 (1991)
- On the Sodium Excess in the Atmospheres of Yellow Supergiants. *N. Prantzos, A. Coc, & J. P. Thibaud.* 379, 729, 173-G1 (1991)
- High-Mass Stars with Degenerate Neutron Cores. *Garrett T. Bieble.* 380, 167, 178-B9 (1991)
- The Galactic Globular Cluster System: Theoretical Constraints for  $\alpha$ -enhanced Compositions. *D. Bencivenni, F. Caputo, M. Manteiga, & M. L. Quarta.* 380, 484, 184-C1 (1991)
- Three-dimensional Compressible Hydrodynamic Convection in the Sun and Stars. *Murshed Hossain & D. J. Mullan.* 380, 631, 186-A10 (1991)
- Evolutionary Sequences of Stellar Models of Intermediate and High Mass Including Convective Core Overshooting. *Chao-wen Chin & Richard B. Stothers.* 77, 299, 48-C1 (1991)
- On Equation of State Interpolation Errors in Stellar Interior Calculations. *Ben Dorman, Alan W. Irwin, & Brian B. Pedersen.* 381, 228, 191-G4 (1991)
- Advanced Evolutionary Phases of Large-Metallicity Low-Mass Stars and the Problem of the Ultraviolet Excess of Elliptical Galaxies. *Marco Castellani & Amède Tornambé.* 381, 393, 195-E9 (1991)
- Soft X-Ray Pulses from Neutron Star Glitches. *Kenneth A. Van Riper, Richard I. Epstein, & Guy S. Miller.* 381, L47, 199-C1 (1991)
- Metal Opacities and Convective Core Overshooting in Population I Stars. *Richard B. Stothers & Chao-wen Chin.* 381, L67, 199-E7 (1991)
- Rayleigh-Taylor Instability in the Asymmetric Supernova Explosion. *Shoichi Yamada & Katsuhiko Sato.* 382, 594, 208-G12 (1991)
- Massive Star Evolution and SN 1987A. *David Arnett.* 383, 295, 215-G8 (1991)
- Effects of Negatively Charged Massive Particles on Primordial Stars. *R. N. Boyd & G. M. Fuller.* 383, 615, 221-G12 (1991)
- A Conjecture Regarding the Evolution of Dwarf Stars into Red Giants. *P. P. Eggleton & R. C. Cannon.* 383, 757, 223-E12 (1991)
- Effects of Drag Luminosity in the Common Envelope Phase of Slow Novae. *Mariko Kato & Izumi Hachisu.* 383, 761, 223-F3 (1991)
- Post-Asymptotic Giant Branch Nonradial Instability Strips. *Letizia Stanghellini, Arthur N. Cox, & Sumner Starrfield.* 383, 766, 223-F10 (1991)
- Observational Tests of Convective Core Overshooting in Stars of Intermediate to High Mass in the Galaxy. *Richard B. Stothers.* 383, 820, 224-D8 (1991)
- Implications of Helium Diffusion for Globular Cluster Isochrones and Luminosity Functions. *Charles R. Proffitt & Don A. VandenBerg.* 77, 473, 51-C10 (1991)
- STARS: LATE-TYPE**
- CO Fundamental Bands in Late-Type Stars. II. Spectrum Simulations for F-K Stars. *Gunter Wiedemann & Thomas R. Ayres.* 386, 277, 4-D9 (1991)
- Mixing Length and Opacity Effects: Deep Convective Envelopes on the Asymptotic Giant Branch. *J. Julian Sackmann & Arnold I. Boothroyd.* 386, 529, 9-E7 (1991)

- Spectroscopy of Taurus Cloud Brown Dwarf Candidates.** *John Stauffer, Terry Herter, Donald Hamilton, George H. Rieke, Marcia J. Rieke, Ron Probst, & William Forrest.* 367, L23, 17-D7 (1991)
- Detection of  $^{13}\text{C}$  Isotopomers of  $\text{HC}_3\text{N}$  ( $J = 9-8$ ) in the Circumstellar Envelope of IRC +10216.** *M. B. Bell & P. A. Feldman.* 367, L33, 17-E8 (1991)
- Excitation of Millimeter and Submillimeter Water Masers.** *David A. Neufeld & Gary J. Melnick.* 368, 215, 25-F11 (1991)
- Nonthermal Radio Emission from the X-Ray-Bright K5 IV Star 1E 1751+7046.** *Stephen L. Skinner.* 368, 272, 26-D11 (1991)
- Chemical Abundances for Cyanogen-weak Giants.** *R. Earle Luck.* 75, 579, 8-F11 (1991)
- Circular Polarization in 1612 MHz OH Maser Emission from OH/IR Stars.** *Philip J. Zell & John D. Fix.* 369, 506, 44-A9 (1991)
- Evolution of the Chromospheres and Winds of Low- and Intermediate-Mass Giant Stars.** *P. G. Judge & R. E. Stencel.* 371, 357, 64-E3 (1991)
- Carbon Isotope Ratios along the Giant Branch of M67.** *Kalpana Krishnamury Gibroy & Jeffery A. Brown.* 371, 578, 68-F7 (1991)
- Further Limits on Disklike Dark Matter from K Dwarf Kinematics.** *Konrad Kuijken.* 372, 125, 75-E7 (1991)
- Qualitative Explanations of Red Giant Formation.** *R. Bhaskar & Anil Nigam.* 372, 592, 83-A10 (1991)
- Rotational Modulation in IUE Spectra of Cool Dwarf Chromospheres. I. Data Analysis and Period Search Techniques.** *K. L. Hallam, B. Alner, & A. S. Endal.* 372, 610, 83-C1 (1991)
- The Halo of the Large Magellanic Cloud: Kinematics of the CH Stars.** *A. P. Cowley & F. D. A. Hartwick.* 373, 80, 87-A8 (1991)
- X-Ray Emission from Hybrid-Chromosphere Stars.** *Alexander Brown, Stephen A. Drake, Michael E. Van Steenberg, & Jeffrey L. Linsky.* 373, 614, 95-E9 (1991)
- The Chromospheric Activity of Low-Mass Stars in the Hyades.** *John R. Stauffer, Mark S. Giampapa, William Herbst, James M. Vincent, Lee W. Hartmann, & Robert A. Stern.* 374, 142, 99-G1 (1991)
- Broad-Band Linear Polarization in Cool Stars. I. Models and Spatial Effects for Magnetic and Scattering Regions.** *Juhani Huovelin & Steven H. Saar.* 374, 319, 102-B1 (1991)
- Shell Helium Burning in Low-Mass Stars. I. Models in Thermal Equilibrium.** *Masayuki Y. Fujimoto & Icko Iben, Jr.* 374, 631, 107-A1 (1991)
- Hydrodynamic Pulsation Models of Yellow Supergiant Stars in the Post-Asymptotic Giant Branch.** *Toshiki Aikawa.* 374, 700, 107-F13 (1991)
- A Critical Appraisal of Published Values of [Fe/H] for K II-IV Stars.** *Benjamin J. Taylor.* 76, 715, 34-E12 (1991)
- Brown Dwarfs in Young Stellar Clusters.** *Guy S. Stringfellow.* 375, L21, 117-C7 (1991)
- The Chromospheric Emission-Age Relation for Stars of the Lower Main Sequence and Its Implications for the Star Formation Rate.** *David R. Soderblom, Douglas K. Duncan, & Dean R. H. Johnson.* 375, 722, 121-F5 (1991)
- First Results from the Goddard High-Resolution Spectrograph: The Chromosphere of  $\alpha$  Tauri.** *Kenneth G. Carpenter, Richard D. Robinson, Glenn M. Wahlgren, Thomas B. Ake, Dennis C. Ebets, Jeffrey L. Linsky, Alexander Brown, & Frederick M. Walter.* 377, L45, 143-E11 (1991)
- Metallicity and Velocity Distribution of Giants toward the Galactic Poles.** *Kavan U. Ratnatunga & Kenneth M. Yoss.* 377, 442, 145-C3 (1991)
- 321 GHz Submillimeter Water Masers around Evolved Stars.** *Karl M. Menten & Gary J. Melnick.* 377, 647, 147-F8 (1991)
- Multichannel Astrometric Photometer-based Parallaxes of Evolved Stars:  $\chi$  Cygni, 51 Andromedae, and OP Andromedae.** *John W. Stein.* 377, 669, 148-A5 (1991)
- Heating Mechanism(s) for Transition Layers in Giants.** *Erika Böhm-Vitense & José Mena-Werth.* 378, 718, 161-C8 (1991)
- Galactic Bulge M Giants. IV. 0.5-2.5 Micron Spectrophotometry and Abundances for Stars in Baade's Window.** *D. M. Terndrup, Jay A. Frogel, & A. E. Whifford.* 378, 742, 161-E5 (1991)
- Excitation of the Hydroxyl Maser in OH/IR Stars.** *Dale F. Dickinson.* 379, L29, 169-C11 (1991)
- Fe II Emission Lines. I. Chromospheric Spectra of Red Giants.** *P. G. Judge & C. Jordan.* 77, 75, 44-E1 (1991)
- Abundances in Red Giant Stars: Nitrogen Isotopes in Carbon-rich Molecular Envelopes.** *P. G. Wannier, B.-G. Andersson, H. Olofsson, N. Ukita, & K. Young.* 380, 593, 185-E8 (1991)
- Carbon Isotopic Abundances in Giant Stars in the CN-bimodal Globular Clusters NGC 6752 and M4.** *Nicholas B. Suntzeff & Verne V. Smith.* 381, 160, 191-A8 (1991)
- Numerical Simulations of Flares on M Dwarf Stars. I. Hydrodynamics and Coronal X-Ray Emission.** *Chung-Chieh Cheng & Roberto Pallavicini.* 381, 234, 191-G12 (1991)
- Abundances of Tc and Related Elements in Stars of Type M, MS, and S.** *Andrew D. Vanture, George Wallerstein, Jeffery A. Brown, & Grant Bazar.* 381, 278, 192-D7 (1991)
- Stellar Encounters Involving Red Giants in Globular Cluster Cores.** *M. B. Davies, W. Benz, & J. G. Hills.* 381, 449, 196-C7 (1991)
- Cocoon Stars in the Large Magellanic Cloud.** *Neill Reid.* 382, 143, 202-A4 (1991)
- STARS: LONG-PERIOD VARIABLES**
- Flares on Mira Stars?** *Bradley E. Schaefer.* 366, L39, 6-E1 (1991)
- From Wind to Superwind: The Evolution of Mass-Loss Rates for Mira Models.** *G. H. Bowen & L. A. Willson.* 375, L53, 124-C1 (1991)
- 321 GHz Submillimeter Water Masers around Evolved Stars.** *Karl M. Menten & Gary J. Melnick.* 377, 647, 147-F8 (1991)
- Kinematical Models of Maser Shells Formed by Aspherical Stellar Outflows (U Orionis; OH 231.8+4.2; Orion-IRc2).** *P. F. Bowers.* 76, 1099, 40-G9 (1991)
- Abundances of Tc and Related Elements in Stars of Type M, MS, and S.** *Andrew D. Vanture, George Wallerstein, Jeffery A. Brown, & Grant Bazar.* 381, 278, 192-D7 (1991)
- The Mode of Pulsation in Mira Variables Determined by the Observed Acceleration Data.** *Y. Tuchman.* 383, 779, 223-G11 (1991)
- STARS: LOW-MASS**
- Spectroscopy of Taurus Cloud Brown Dwarf Candidates.** *John Stauffer, Terry Herter, Donald Hamilton, George H. Rieke, Marcia J. Rieke, Ron Probst, & William Forrest.* 367, L23, 17-D7 (1991)
- Cooling Flows and the Formation of Massive Halos in cD Galaxies.** *Andrea H. Prestwich & Marshall Joy.* 369, L1, 40-A7 (1991)
- Lithium in the Most Extreme Halo Stars; Trends with Metallicity.** *Constantine P. Deliyannis & Pierre Demarque.* 370, L89, 59-E5 (1991)
- Gravitational Microlensing as a Method of Detecting Disk Dark Matter and Faint Disk Stars.** *Kim Griest, Charles Alcock, Timothy S. Axelrod, David P. Bennett, Kem H. Cook, Kenneth C. Freeman, Hye-Sook Park, Saul Perlmutter, Bruce A. Peterson, Peter J. Quinn, Alexander W. Rodgers, & Christopher W. Stubbs (The MACHO Collaboration).* 372, L79, 85-D5 (1991)
- Globular Cluster Mass Functions.** *Harvey B. Richer, Gregory G. Faherty, Roberto Buonanno, Flavio Fusi Pecci, Leonard Searle, & Ian B. Thompson.* 381, 147, 190-G7 (1991)
- STARS: LUMINOSITIES**
- Classical Cepheid Luminosities from Binary Companions.** *Nancy Remage Evans.* 372, 597, 83-B1 (1991)
- The Globular Cluster  $\omega$  Centauri: The Origin of the Mysterious Correlation between the RR Lyrae Luminosity and [Fe/H].** *Young-Wook Lee.* 373, L43, 97-B7 (1991)
- Brown Dwarfs in Young Stellar Clusters.** *Guy S. Stringfellow.* 375, L21, 117-C7 (1991)
- Absolute Magnitudes and Kinematic Properties of Cepheids.** *Teresa D. Wilson, Thomas G. Barnes III, Suzanne L. Hawley, & William H. Jefferys.* 378, 708, 161-B11 (1991)
- STARS: RR LYRAE**
- Application of Oxygen-enhanced Evolutionary Sequences to the Horizontal Branch of M15.** *Ben Dorman, Young-Wook Lee, & Don A. VandenBerg.* 366, 115, 2-D11 (1991)
- Stellar Evolution and Period Changes in RR Lyrae Stars.** *Young-Wook Lee.* 367, 524, 19-G7 (1991)
- Metal Abundances of RR Lyrae Variables in Selected Galactic Star Fields. V. The Lick Astrographic Fields at Intermediate Galactic Latitudes.** *Nicholas B. Suntzeff, T. D. Kinman, & Robert P. Kraft.* 367, 528, 19-G13 (1991)
- Two Double-Mode RR Lyrae Stars in the Field.** *Christine M. Clement, T. D. Kinman, & Nicholas B. Suntzeff.* 372, 273, 77-C13 (1991)
- Single and Binary Star Evolution.** *Icko Iben, Jr.* 76, 55, 24-G3 (1991)

- The Globular Cluster  $\omega$  Centauri: The Origin of the Mysterious Correlation between the RR Lyrae Luminosity and [Fe/H]. *Young-Wook Lee.* 373, L43, 97-B7 (1991)
- Detection of a Galactic Color Gradient for Blue Horizontal-Branch Stars of the Halo Field and Implications for the Halo Age and Density Distributions. *George W. Preston, Stephen A. Shectman, & Timothy C. Beers.* 375, 121, 112-E1 (1991)
- The Evolution of He-burning Stars: Horizontal and Asymptotic Branches in Galactic Globulars. *V. Castellani, A. Chieffi, & L. Pulone.* 76, 911, 37-C5 (1991)
- The RRd Masses Revisited. *Norman R. Simon & Arthur N. Cox.* 376, 717, 135-C1 (1991)
- The Metallicity of RR Lyrae Stars in Baade's Window. *Alistair R. Walker & Donald M. Terndrup.* 378, 119, 152-D13 (1991)
- Masses of RRd Variables Using Livermore OPAL Opacities. *Arthur N. Cox.* 381, L71, 199-F1 (1991)
- STARS: MAGNETIC**
- Rotation and Magnetism in White Dwarfs. *Gary D. Schmidt & Jane E. Norwrothy.* 366, 270, 4-D1 (1991)
- Spectroscopy of FO Aquarii: Evidence for Reprocessing in a Hot Wind. *Phillip J. Martell & Ronald H. Kaitchuck.* 366, 286, 4-E5 (1991)
- Nonthermal X-Ray Emission from Winds of OB Supergiants. *Wan Chen & Richard L. White.* 366, 512, 9-D1 (1991)
- A Crucial Test of the Diffusion Model: 53 Camelopardalis. *J. Babel & G. Michaud.* 366, 560, 10-A5 (1991)
- Thomson Scattering in a Magnetic Field. II. Arbitrary Field Orientation. *Barbara A. Whitney.* 369, 451, 43-C10 (1991)
- Be Stars: Chromospheres and Cool Envelopes and Their Relation to Magnetic Fields. *A. E. Ringuelet & M. E. Iglesias.* 369, 463, 43-D10 (1991)
- Possible Detection of TeV Gamma Rays from AM Herculis. *C. L. Bhat, R. K. Kaul, H. S. Rawat, V.K. Seneca, R. C. Rannat, M. L. Sapru, A. K. Tickoo, & H. Razdan.* 369, 475, 43-E12 (1991)
- Three-dimensional Structures of Magnetostatic Atmospheres. III. A General Formulation. *B. C. Low.* 370, 427, 52-E8 (1991)
- Disk Accretion onto Magnetic T Tauri Stars. *Arash Königl.* 370, L39, 53-E13 (1991)
- Dynamic Magnetic Reconnection at an X-Type Neutral Point. I. *J. D. Craig & A. N. McClymont.* 371, L41, 66-F1 (1991)
- Synchronization of the Magnetic Nova V1500 Cygni. *Gary D. Schmidt & H. S. Stockman.* 371, 749, 70-G7 (1991)
- Thomson Scattering in a Magnetic Field. I. Field along z. *Barbara A. Whitney.* 75, 1293, 22-F1 (1991)
- Magnetic Two-Photon Scattering and Two-Photon Emission: Cross Sections and Redistribution Functions. *S. G. Alexander & P. Mészáros.* 372, 554, 82-E11 (1991)
- Cyclotron Harmonics in Accreting Pulsars and Gamma-Ray Bursters: Effect of Two-Photon Processes. *S. G. Alexander & P. Mészáros.* 372, 565, 82-F9 (1991)
- Broad-Band Linear Polarization in Cool Stars. I. Models and Spatial Effects for Magnetic and Scattering Regions. *Juhani Huovelin & Steven H. Saar.* 374, 319, 102-B1 (1991)
- Equation of State in a Strong Magnetic Field: Finite Temperature and Gradient Corrections. *Andrew M. Abrahams & Stuart L. Shapiro.* 374, 652, 107-B12 (1991)
- A Theory of Gamma-Ray Bursts Based on Resonant Compton Scattering. *Peter Vitello & Charles D. Dermer.* 374, 668, 107-D1 (1991)
- V1500 Cygni: A Prediction. *J. I. Katz.* 374, L59, 110-D11 (1991)
- The Formation and Detection of Strongly Magnetic White Dwarf Binaries in Globular Clusters. *G. Channugam, A. Ray, & K. P. Singh.* 375, 600, 120-B9 (1991)
- Cyclotron Line Features in the Spectrum of the Transient X-Ray Pulsar X0115+634. *F. Nagase, T. Dotani, Y. Tanaka, K. Makishima, T. Mihara, T. Sakao, H. Tsunemi, S. Kitamoto, K. Tamura, A. Yoshida, & H. Nakamura.* 375, L49, 124-B11 (1991)
- On Turbulent Diffusion of Magnetic Fields and the Loss of Magnetic Flux from Stars. *Samuel I. Vainshtein & Robert Rosner.* 376, 199, 127-D7 (1991)
- Rotational Evolution of Solar-Type Stars. I. Main-Sequence Evolution. *K. B. MacGregor & M. Brenner.* 376, 204, 127-D13 (1991)
- Spin Evolution and Magnetic Fields in Cataclysmic Variables. *Andrew R. King & Jean-Pierre Lasota.* 378, 674, 160-G1 (1991)
- Discovery of a Cyclotron Resonance Feature at 30 keV from the Transient X-Ray Pulsar Cepheus X-4. *T. Mihara, K. Makishima, S. Kamijo, T. Ohashi, F. Nagase, Y. Tanaka, & K. Koyama.* 379, L61, 175-C6 (1991)
- Superfluid Hydrodynamics in Rotating Neutron Stars. I. Nondissipative Equations. *Gregory Mendell.* 380, 515, 184-F1 (1991)
- Superfluid Hydrodynamics in Rotating Neutron Stars. II. Dissipative Effects. *Gregory Mendell.* 380, 530, 184-G3 (1991)
- A Connection between Long-Term Luminosity Variations and Orbital Period Changes in Chromospherically Active Binaries. *Douglas S. Hall.* 380, L85, 188-F1 (1991)
- Molecules and Chains in a Strong Magnetic Field: Statistical Treatment. *Andrew M. Abrahams & Stuart L. Shapiro.* 382, 233, 203-B5 (1991)
- Neutron Star Crustal Plate Tectonics. II. Evolution of Radio Pulsar Magnetic Fields. *M. Ruderman.* 382, 576, 208-F4 (1991)
- Cold Equation of State in a Strong Magnetic Field: Effects of Inverse  $\beta$ -Decay. *Dong Lai & Stuart L. Shapiro.* 383, 745, 223-D11 (1991)
- STARS: MASS-LOSS**
- Circumstellar Material around the Massive Close Binary DH Cephei. *M. F. Corcoran.* 366, 308, 4-G8 (1991)
- Using SN 1987A Light Echoes to Determine Mass Loss from the Progenitor. *Arlin P. S. Crofts & William E. Kunkel.* 366, L73, 11-D1 (1991)
- Distribution of Dust about  $\alpha$  Ceti and  $\alpha$  Orionis Based on 11 Micron Spatial Interferometry. *M. Bester, W. C. Danchi, C. G. Degiacomi, C. H. Townes, & T. R. Geballe.* 367, L27, 17-E1 (1991)
- On Winds and X-Rays of O-Type Stars. *Tomasz Chlebowski & Catharine D. Garmany.* 368, 241, 26-B1 (1991)
- On the Possible Bipolar Nature of 21 Micron IRAS Sources. *Bruce J. Hrivnak & S. Kwok.* 368, 564, 32-B1 (1991)
- Theoretical Light Curve for the Recurrent Nova RS Ophiuchi—Determination of the White Dwarf Mass, Composition, and Distance. *Mariko Katao.* 369, 471, 43-E6 (1991)
- Star Formation and the Nature of Bipolar Outflows. *Frank H. Shu, Steven P. Ruden, Charles J. Lada, & Susana Lizano.* 370, L31, 53-E1 (1991)
- Mass Outflow in the Nearby Proto-Planetary System  $\beta$  Pictoris. *Frederick C. Bruhweiler, Yoji Kondo, & C. A. Grady.* 371, L27, 66-D7 (1991)
- Mixing Layers in Stellar Outflows. *J. Cantó & A. C. Raga.* 372, 646, 83-F7 (1991)
- Magnetic Confinement, Alfvén Wave Reflection, and the Origins of X-Ray and Mass-Loss "Dividing Lines" for Late-Type Giants and Supergiants. *R. Rosner, C.-H. An, Z. E. Musielak, R. L. Moore, & S. T. Suess.* 372, L91, 85-E5 (1991)
- Double Core Evolution. IV. The Late Stages of Evolution of a  $2 M_{\odot}$  Red Giant with a  $1 M_{\odot}$  Companion. *Ronald E. Taam & Peter Bodenheimer.* 373, 246, 89-A10 (1991)
- The Common Envelope Phase in Classical Novae: One-dimensional Models. *Anurag Shankar, Mario Livio, & James W. Truran.* 374, 623, 106-G6 (1991)
- From Wind to Superwind: The Evolution of Mass-Loss Rates for Mira Models. *G. H. Bowen & L. A. Willson.* 375, L53, 124-C1 (1991)
- Mass Loss in the 96 Day Binary UU Cancri. *Joel A. Eaton, Douglas S. Hall, & R. Kent Honeycutt.* 376, 289, 128-E1 (1991)
- Molecular Outflows Associated with Young Stellar Objects in the L1641 Region of Orion. *James A. Morgan, F. Peter Schloerb, Ronald L. Snell, & John Bally.* 376, 618, 134-A12 (1991)
- Observations of Stellar Winds from Hot Stars at 1.3 Millimeters. *Claus Leitherer & Carmelle Robert.* 377, 629, 147-E1 (1991)
- Constraints on the Physical Properties of Optical Bullets in SS 433. *John C. Brown, Joseph P. Cassinelli, & George W. Collins II.* 378, 307, 154-G1 (1991)
- Can Neutron Stars Ablate Their Companions? *Amir Levinson & David Eichler.* 379, 359, 167-E1 (1991)
- An Observational Connection between Circumstellar Disk Mass and Molecular Outflows. *Sylvie Cabrit & Philippe André.* 379, L25, 169-C6 (1991)

- Interaction of Mass Lost in Globular Clusters with the Halo Medium.** *D. J. Faulkner & Graeme H. Smith.* 380, 441, 183-F7 (1991)
- Particle Emissivity in Circumstellar Disks.** *Steven V. W. Beckwith & Anneila I. Sargent.* 381, 250, 192-B1 (1991)
- On the Nature of the Excess 100 Micron Flux Associated with Carbon Stars.** *Michael P. Egan & Chun Ming Leung.* 383, 314, 216-B1 (1991)
- STARS: MASSIVE**
- s-Process Nucleosynthesis in Massive Stars and the Weak Component.**
  - I. Evolution and Neutron Captures in a  $25 M_{\odot}$  Star. *C. M. Raiteri, M. Busso, R. Gallino, G. Picchio, & L. Pulone.* 367, 228, 14-G13 (1991)
- Wolf-Rayet Stars as Starting Points or as Endpoints of the Evolution of Massive Stars? H. J. G. L. M. Lamers, A. Maeder, W. Schmutz, & J. P. Cassinelli.** 368, 538, 31-F12 (1991)
- s-Process Nucleosynthesis in Massive Stars and the Weak Component.**
  - II. Carbon Burning and Galactic Enrichment. *C. M. Raiteri, M. Busso, R. Gallino, & G. Picchio.* 371, 665, 69-G6 (1991)
- Si IV and C IV Resonance Lines as Indicators of Massive Stars in Starburst Galaxies.** *Claus Leitherer & Henry J. G. L. M. Lamers.* 373, 89, 87-B6 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Spectroscopic Determination of Stellar Parameters of Melnick 42, an O3f Star in the Large Magellanic Cloud.** *S. R. Heap, B. Altner, D. Ebbets, I. Hubeny, J. B. Hutchings, R. P. Kudritzki, S. A. Voels, S. Haser, A. Pauldrach, J. Puls, & K. Butler.* 377, L29, 143-D6 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Evidence for Photospheric Microturbulence in Early O Stars: Are Surface Gravities Systematically Underestimated?** *I. Hubeny, S. R. Heap, & B. Altner.* 377, L33, 143-D11 (1991)
- First Results from the Faint Object Camera: High-Resolution Observations of the Central Object R136 in the 30 Doradus Nebula.** *G. Weigelt, R. Albrecht, C. Barbieri, J. C. Blades, A. Bokkenberg, P. Crane, J. M. Deharveng, M. J. Disney, P. Jakobson, T. M. Kamperman, I. R. King, F. Macchietto, C. D. Mackay, F. Parese, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, & W. B. Sparks.* 378, L21, 157-C7 (1991)
- High-Mass Stars with Degenerate Neutron Cores.** *Garrett T. Biehle.* 380, 167, 178-B9 (1991)
- Evolutionary Sequences of Stellar Models of Intermediate and High Mass Including Convective Core Overshooting.** *Chao-wen Chin & Richard B. Stothers.* 77, 299, 48-C1 (1991)
- Massive Star Evolution and SN 1987A.** *David Arnett.* 383, 295, 215-G8 (1991)
- STARS: METALLIC-LINE**
- Meridional Circulation and Diffusion in A and Early F Stars.** *Paul Charbonneau & Georges Michaud.* 370, 693, 57-A10 (1991)
- STARS: NEUTRON**
- On the Nature of Soft Gamma Repeaters.** *J. P. Norris, P. Hertz, K. S. Wood, & C. Kouveliotou.* 366, 240, 4-A8 (1991)
- The Orbital Ephemeris and Eclipse Transitions of the Low-Mass X-Ray Binary EXO 0748-676.** *A. N. Parmar, A. P. Smale, F. Verbunt, & R. H. D. Corbet.* 366, 253, 4-B9 (1991)
- Neutron Star Crustal Plate Tectonics. I. Magnetic Dipole Evolution in Millisecond Pulsars and Low-Mass X-Ray Binaries.** *M. Ruderman.* 366, 261, 4-C5 (1991)
- Sigma Observation of the Pulsar OAO 1657-415: Precise Localization at Hard X-Ray Energy and Discovery of Spin-down.** *S. Mereghetti, J. Ballet, A. Lambert, P. Mandrou, L. Natalucci, J. Paul, J. P. Roques, L. Salotti, M. Gilfanov, R. Sunyaev, G. Babalyan, E. Churazov, N. Khavenson, A. Kuznetsov, D. Stepanov, & S. Yunin.* 366, L23, 6-C11 (1991)
- Birthrates of Galactic Millisecond Pulsars and Their Low-Mass X-Ray Binary Precursors.** *Marco Tavani.* 366, L27, 6-D1 (1991)
- Monte Carlo Simulation of Comptonization in Plasma Accreting onto Neutron Stars.** *Tomoyuki Hanawa.* 366, 495, 9-B9 (1991)
- The Proper Motion of the Soft X-Ray-emitting Radio Pulsar PSR 0656+14.** *R. J. Thompson, Jr., F. A. Córdova, R. M. Hjellming, & E. B. Fomalont.* 366, L83, 11-E1 (1991)
- Application of a General Relativistic Accretion Disk Model to LMC X-1, LMC X-3, X1608-522, and X1636-536.** *Ken Ebisawa, Kazuhisa Mitsuda, & Tomoyuki Hanawa.* 367, 213, 14-F8 (1991)
- Optical and Radio Observations of the Binary Pulsar 1855+09: Evolution of Pulsar Magnetic Fields and Low-Mass White Dwarf Cooling.** *S. R. Kulkarni, S. Djorgovski, & A. R. Klemola.* 367, 221, 14-G4 (1991)
- Conditions for Accretion-induced Collapse of White Dwarfs.** *Ken'ichi Nomoto & Yoji Kondo.* 367, L19, 17-D1 (1991)
- Accretion Powered Pulsars: Continuum Spectra and Light Curves of Settling Accretion Mounds.** *David J. Burnard, Jonathan Arons, & Richard J. Klein.* 367, 575, 20-D10 (1991)
- Formulae for the Cyclotron Luminosity of Magnetized Plasma Slabs.** *G. Chanmugam & Steven H. Langer.* 368, 580, 32-C11 (1991)
- Neutron Star Thermal Evolution.** *Kenneth A. Van Riper.* 75, 449, 6-G7 (1991)
- The Appearance of Highly Relativistic, Spherically Symmetric Stellar Winds.** *Marek A. Abramowicz, Igor D. Novikov, & Bohdan Paczyński.* 369, 175, 38-B5 (1991)
- Explosion of a Rotating Neutron Star near the Minimum Mass.** *Monica Colpi, Stuart L. Shapiro, & Saul A. Teukolsky.* 369, 422, 43-A5 (1991)
- Near-critical Spherical Accretion by Neutron Stars: General Relativistic Treatment.** *Myeong-Gu Park & Guy S. Miller.* 371, 708, 70-D1 (1991)
- High-Precision Timing of Millisecond Pulsars. I. Astrometry and Masses of the PSR 1855+09 System.** *M. F. Ryba & J. H. Taylor.* 371, 739, 70-F9 (1991)
- Numerical Solution of the General Relativistic Boltzmann Equation for Massive and Massless Particles.** *Hugh Harleston & Katherine A. Holcomb.* 372, 225, 76-F13 (1991)
- White Dwarf and Neutron Star Interior Solutions in the Nonsymmetric Gravitational Theory.** *L. M. Campbell, J. W. Moffat, & P. Savaria.* 372, 241, 77-A1 (1991)
- Steady State Energy Sources in Neutron Stars.** *Kenneth A. Van Riper.* 372, 251, 77-A13 (1991)
- Oscillations of Rotating Neutron Stars.** *Tod E. Strohmayer.* 372, 573, 82-G5 (1991)
- The Outcome of Explosive Ignition of ONeMg Cores: Supernovae, Neutron Stars, or "Iron" White Dwarfs?** *Jordi Isern, Ramon Canal, & Javier Labay.* 372, L83, 85-D9 (1991)
- Hard X-Ray Spectra from Gap Accretion onto Neutron Stars.** *Włodzimierz Kluźniak & James R. Wilson.* 372, L87, 85-E1 (1991)
- Transverse Conductivity of a Relativistic Plasma in Oblique Electric and Magnetic Fields.** *Fulvio Melia & Marco Fatuzzo.* 373, 198, 88-D8 (1991)
- Rotation of the Neutron-Drip Superfluid in Pulsars: The Interaction and Pinning of Vortices.** *P. B. Jones.* 373, 208, 88-E6 (1991)
- The Oscillations of Rapidly Rotating Newtonian Stellar Models. II. Dissipative Effects.** *James R. Ipser & Lee Lindblom.* 373, 213, 88-E12 (1991)
- High-Energy X-Ray Production in a Boundary Layer of an Accreting Neutron Star.** *Tomoyuki Hanawa.* 373, 222, 88-F9 (1991)
- The Near-Infrared Spectra of Low-Mass X-Ray Binaries and Related Objects.** *A. P. Cowley, P. C. Schmidtke, D. Crampton, J. B. Hutchings, & M. Bolte.* 373, 228, 88-G1 (1991)
- Structure and Stability of Rotating Relativistic Neutron Stars.** *F. Weber, N. K. Glendenning, & M. K. Weigel.* 373, 579, 95-B10 (1991)
- Mechanics and Energetics of Vortex Unpinning in Neutron Stars.** *Bennett K. Link & Richard I. Epstein.* 373, 592, 95-C11 (1991)
- Multipolar Magnetic Fields in Neutron Stars.** *Julian H. Krolik.* 373, L69, 97-E4 (1991)
- Equation of State in a Strong Magnetic Field: Finite Temperature and Gradient Corrections.** *Andrew M. Abrahams & Stuart L. Shapiro.* 374, 652, 107-B12 (1991)
- A Theory of Gamma-Ray Bursts Based on Resonant Compton Scattering.** *Peter Vitello & Charles D. Dermer.* 374, 668, 107-D1 (1991)
- Gamma-Ray Bursts from Colliding Strange Stars.** *P. Haensel, B. Paczyński, & P. Amsterdamski.* 375, 209, 113-E10 (1991)
- The Shear Modulus of the Neutron Star Crust and Nonradial Oscillations of Neutron Stars.** *T. Strohmayer, S. Ogata, H. Iyetomi, S. Ichimaru, & H. M. Van Horn.* 375, 679, 121-B7 (1991)
- Model Atmospheres and X-Ray Spectra of Bursting Neutron Stars.** *Jerzy Madej.* 376, 161, 127-A4 (1991)

- Steady Spherical Hypercritical Accretion onto Neutron Stars.** *John C. Houck & Roger A. Chevalier.* 376, 234, 127-G6 (1991)
- The X-Ray Properties of GX 301-2 (4U 1223-62).** *F. Haberl.* 376, 245, 128-A5 (1991)
- Detection of a Feature at 0.44 MeV in the Crab Pulsar Spectrum with FIGARO II: A Redshifted Positron Annihilation Line?** *E. Massaro, G. Masi, M. Salvati, E. Costa, P. Mandrou, M. Niel, J. F. Oliva, T. Mineo, B. Sacco, L. Scarsi, G. Gerardi, B. Agrinier, E. Barouch, R. Comte, B. Parlier, & J. L. Masnou.* 376, L11, 130-B7 (1991)
- Transient Particle Acceleration in Strongly Magnetized Neutron Stars.** *Fulvio Melia & Marco Fatuzzo.* 376, 673, 134-F7 (1991)
- PSR 0540+23 Revised: Three Components, Drifting Subpulses, and Mode Switching.** *Leszek A. Nowakowski.* 377, 581, 147-A1 (1991)
- Equation of State in Metals and Cold Stars: Evaluation of Statistical Models.** *Dong Lai, Andrew M. Abrahams, & Stuart L. Shapiro.* 377, 612, 147-C10 (1991)
- On Spectra of X-Ray Bursters in the Expansion Phase. I. I. Lapidus.** 377, L93, 150-E1 (1991)
- Radiative-hydrodynamical Simulations of Accretion Disk Coronae.** *Fulvio Melia, Gregory J. Zylstra, & Bruce Fryxell.* 377, L101, 150-E1 (1991)
- The Contribution of Light Bending and Redshift to the Pulse Characteristics of a Pulsar in the Case of Smaller Neutron Stars.** *R. C. Kapoor.* 378, 227, 153-G1 (1991)
- Astrophysical Limits for Binding Energy of Strange Matter.** *M. I. Krivoruchenko & B. V. Martemyanov.* 378, 628, 160-C1 (1991)
- A Mechanism for Gamma-Ray Bursts by Alfvén-Wave Acceleration in a Nonuniform Atmosphere.** *K. A. Holcomb & T. Tajima.* 378, 682, 160-G10 (1991)
- SN 1988A in M58: Departure from  $^{56}\text{Co}$  Decay 700 Days after Explosion.** *P. Ruiz-Lapuente, M. Kidger, G. Gómez, R. Canal, & R. López.* 378, L41, 162-E1 (1991)
- Searches for Millisecond Pulsations in Low-Mass X-Ray Binaries.** *K. S. Wood, J. P. Norris, P. Hertz, B. A. Vaughan, P. F. Michelson, K. Mitsuda, W. H. G. Lewin, J. van Paradijs, W. Penninx, & M. van der Klis.* 379, 295, 166-F9 (1991)
- X-Ray-illuminated Stellar Winds: Optically Thick Wind Models for Massive X-Ray Binaries.** *Ian R. Stevens.* 379, 310, 167-A1 (1991)
- The Inability of the Resonant Compton Upscattering Model of Gamma-Ray Bursts to Produce a Third Cyclotron Harmonic.** *J. J. Brainerd.* 379, L57, 175-C1 (1991)
- Discovery of a Cyclotron Resonance Feature at 30 keV from the Transient X-Ray Pulsar Cepheus X-4.** *T. Mihara, K. Makishima, S. Kamijo, T. Ohashi, F. Nagase, Y. Tanaka, & K. Koyama.* 379, L61, 175-C6 (1991)
- The Rate of Neutron Star Binary Mergers in the Universe: Minimal Predictions for Gravity Wave Detectors.** *E. S. Phinney.* 380, L17, 181-C6 (1991)
- Superfluid Hydrodynamics in Rotating Neutron Stars. I. Nondissipative Equations.** *Gregory Mendell.* 380, 515, 184-F1 (1991)
- Superfluid Hydrodynamics in Rotating Neutron Stars. II. Dissipative Effects.** *Gregory Mendell.* 380, 530, 184-G3 (1991)
- Radiative Widths and Splitting of Cyclotron Lines in Superstrong Magnetic Fields.** *G. G. Pavlov, V. G. Bechastnov, P. Mészáros, & S. G. Alexander.* 380, 541, 185-A1 (1991)
- High-Precision Timing of Millisecond Pulsars. II. Astrometry, Orbital Evolution, and Eclipses of PSR 1957+20.** *M. F. Ryba & J. H. Taylor.* 380, 557, 185-B7 (1991)
- X-Ray Detectability of Gamma-Ray Bursts from M31.** *Edison P. Liang.* 380, L55, 188-B11 (1991)
- The Statistics of Slow Interstellar Accretion onto Neutron Stars.** *O. Blaes & M. Rajagopal.* 381, 210, 191-E10 (1991)
- Gravitational Radiation from Dual Neutron Star Elliptical Binaries.** *Dieter Hils.* 381, 484, 196-F5 (1991)
- Soft X-Ray Pulses from Neutron Star Glitches.** *Kenneth A. Van Riper, Richard I. Epstein, & Guy S. Miller.* 381, L47, 199-C1 (1991)
- Molecules and Chains in a Strong Magnetic Field: Statistical Treatment.** *Andrew M. Abrahams & Stuart L. Shapiro.* 382, 233, 203-B5 (1991)
- Existence of Scattering Atmospheres near Luminous, Magnetized Compact Objects.** *Charles D. Dermer & Steven J. Turner.* 382, L23, 205-C11 (1991)
- Transient Particle Acceleration in Strongly Magnetized Neutron Stars. II. Effects Due to a Dipole Field Geometry.** *Marco Fatuzzo & Fulvio Melia.* 382, 570, 208-E10 (1991)
- Neutron Star Crustal Plate Tectonics. II. Evolution of Radio Pulsar Magnetic Fields.** *M. Ruderman.* 382, 576, 208-F4 (1991)
- Neutron Star Crustal Plate Tectonics. III. Cracking, Glitches, and Gamma-Ray Bursts.** *M. Ruderman.* 382, 587, 208-G3 (1991)
- The Origin of the Planet around PSR 1829-10.** *Takashi Nakamura & Tsvi Piran.* 382, L81, 211-C13 (1991)
- Deep VLA Images of Globular Clusters.** *Helen M. Johnston, Shrinivas R. Kulkarni, & W. M. Goss.* 382, L89, 211-D11 (1991)
- Spectral Signatures of the MeV-PeV Radiation from Accreting Neutron Stars.** *B. Rudak & P. Mészáros.* 383, 269, 215-E3 (1991)
- Decrease in the Orbital Period of Hercules X-1.** *John E. Deeter, Paul E. Boynton, Sigenori Miyamoto, Shunji Kitamoto, Fumiaki Nagase, & Nobuyuki Kawai.* 383, 324, 216-C1 (1991)
- Cold Equation of State in a Strong Magnetic Field: Effects of Inverse  $\beta$ -Decay.** *Dong Lai & Stuart L. Shapiro.* 383, 745, 223-D11 (1991)
- Formation of Dense Charged Bunches in Vacuum Gaps.** *F. Curtis Michel.* 383, 808, 224-C6 (1991)
- V/V<sub>max</sub> Test Applied to Ginga Gamma-Ray Bursts.** *Y. Ogasaka, T. Murakami, J. Nishimura, A. Yoshida, & E. E. Fenimore.* 383, L61, 226-D6 (1991)
- STARS: NOVAE**
- PW Vulpeculae: A Nova with Nearly Solar Abundances.** *Pedro Saizar, Sumner Starrfield, Gary J. Ferland, R. Mark Wagner, James W. Truran, Scott J. Kenyon, Warren M. Sparks, Robert E. Williams, & L. L. Stryker.* 367, 310, 15-G11 (1991)
- Nitrogen Recombination Lines and Abundance in Nova Shells.** *Vladimir Escalante & Alexander Dalgarno.* 369, 213, 38-E7 (1991)
- On the Expected Orbital Period Change in the Next Outburst of the Recurrent Nova T Pyxidis.** *Mario Livio.* 369, L5, 40-A13 (1991)
- The Formation of  $^{26}\text{Al}$  Nova Explosions.** *Irit Nofar, Giora Shaviv, & Sumner Starrfield.* 369, 440, 43-B11 (1991)
- Theoretical Light Curve for the Recurrent Nova RS Ophiuchi—Determination of the White Dwarf Mass, Composition, and Distance.** *Mariko Katao.* 369, 471, 43-E6 (1991)
- Faint Object Camera Observations of a Globular Cluster Nova Field.** *Bruce Margon, Scott F. Anderson, Ronald A. Downes, Ralph C. Bohlin, & Peter Jakobsen.* 369, L71, 46-C1 (1991)
- Multiwavelength Observations of Nova LMC 1990 Number 2: The First Extragalactic Recurrent Nova.** *Steven N. Shore, George Sonneborn, Sumner G. Starrfield, M. Hamuy, R. E. Williams, A. Cassatella, & H. Drechsel.* 370, 193, 49-E8 (1991)
- A Search for Periodicities in the X-Ray Emission from Cataclysmic Variables.** *Michael Eracleous, Joseph Patterson, & Jules Halpern.* 370, 330, 51-D1 (1991)
- Helium Star Cataclysms.** *Icko Iben, Jr., & Alexander V. Tutukov.* 370, 615, 56-B5 (1991)
- Synchronization of the Magnetic Nova V1500 Cygni.** *Gary D. Schmidt & H. S. Stockman.* 371, 749, 70-G7 (1991)
- Single and Binary Star Evolution.** *Icko Iben, Jr.* 76, 55, 24-G3 (1991)
- Is Drag Luminosity Effective in Recurrent Novae?** *Mariko Katao & Izumi Hatchisu.* 373, 620, 95-F1 (1991)
- Thermal X-Ray Emission from Classical Novae in Optical Decline.** *James MacDonald & Stéphane Venne.* 373, L51, 97-C4 (1991)
- High-Speed Photometry of V404 Cygni in Outburst.** *Erik Gouhelf, Joseph Patterson, & Richard J. Stover.* 374, 340, 102-C11 (1991)
- The Common Envelope Phase in Classical Novae: One-dimensional Models.** *Anurag Shankar, Mario Livio, & James W. Truran.* 374, 623, 106-G6 (1991)
- V1500 Cygni: A Prediction.** *J. I. Katz.* 374, L59, 110-D11 (1991)
- A Search for the 478 keV Line from the Decay of Nucleosynthetic  $^7\text{Be}$ .** *Michael J. Harris, Mark D. Leising, & Gerald H. Share.* 375, 216, 113-F5 (1991)
- Diffusion and Mixing in Classical Nova Precursors.** *Icko Iben, Jr., Masayuki Y. Fujimoto, & Jim McDonald.* 375, L27, 117-D1 (1991)
- Are Hypernovae Detectable?** *Seok Jae Park & Ethan T. Vishniac.* 375, 565, 119-F9 (1991)

- The White Dwarf Mass Distribution in Classical Nova Systems.** *Hans Ritter, Michael Politano, Mario Livio, & Ronald F. Webbink.* 376, 177, 127-B10 (1991)
- The Evolution and Classification of Postoutburst Novae Spectra.** *R. E. Williams, M. Hamuy, M. M. Phillips, S. R. Heathcote, Lisa Wells, & M. Navarrete.* 376, 721, 135-C7 (1991)
- Optical Identification of the X-Ray Source GS 2023+338 as V404 Cygni.** *R. Mark Wagner, Sumner G. Starrfield, Steve B. Howell, Tobias J. Kreidl, S. J. Bus, A. Cassatella, R. Bertram, & R. Fried.* 378, 293, 154-E10 (1991)
- Effects of Drag Luminosity in the Common Envelope Phase of Slow Novae.** *Mariko Kato & Izumi Hachisu.* 383, 761, 223-F3 (1991)
- STARS: OF-TYPE**
- First Results from the Goddard High-Resolution Spectrograph: Spectroscopic Determination of Stellar Parameters of Melnick 42, an O3f Star in the Large Magellanic Cloud.** *S. R. Heap, B. Altmer, D. Ebbets, I. Hubeny, J. B. Hutchings, R. P. Kudritzki, S. A. Voels, S. Haser, A. Pauldrach, J. Puls, & K. Butler.* 377, L29, 143-D6 (1991)
- STARS: PECULIAR**
- A Crucial Test of the Diffusion Model: 53 Camelopardalis.** *J. Babel & G. Michaud.* 366, 560, 10-A5 (1991)
- A Simple Accretion/Diffusion Model for  $\lambda$  Bootis Stars.** *Paul Charbonneau.* 372, L33, 79-D13 (1991)
- First Results from the Goddard High-Resolution Spectrograph: High-Resolution Observations of the 1942 Å Resonance Line of Hg II in the Chemically Peculiar B Star,  $\chi$  Lupi.** *David S. Leckrone, Glenn M. Wahlgren, & Sveneric G. Johansson.* 377, L37, 143-E1 (1991)
- STARS: PLANETARY SYSTEMS**
- Constraints on the Companion Object to HD 114762.** *William D. Cochran, Artie P. Hatzes, & Terry J. Hancock.* 380, L35, 181-E6 (1991)
- The Dust Debris around HR 4796.** *M. Jura.* 383, L79, 226-F1 (1991)
- STARS: POPULATION II**
- Evolutionary Models of Halo Stars with Rotation. I. Evidence for Differential Rotation with Depth in Stars.** *Marc H. Pinsonneault, Constantine P. Deliyannis, & Pierre Demarque.* 367, 239, 15-A12 (1991)
- Metal Abundances of RR Lyrae Variables in Selected Galactic Star Fields. V. The Lick Astrographic Fields at Intermediate Galactic Latitudes.** *Nicholas B. Suntzeff, T. D. Kinman, & Robert P. Kraft.* 367, 528, 19-G13 (1991)
- Lithium in the Most Extreme Halo Stars; Trends with Metallicity.** *Constantine P. Deliyannis & Pierre Demarque.* 370, L89, 59-E5 (1991)
- Diffusion and Mixing of Lithium and Helium in Population II Dwarfs.** *Charles R. Proffitt & Georges Michaud.* 371, 584, 68-G1 (1991)
- An Extreme Population II Dwarf without Lithium.** *L. M. Hobbs, D. E. Welty, & J. A. Thorburn.* 373, L47, 97-B13 (1991)
- The Lithium Abundance in Extreme Halo Stars.** *L. M. Hobbs & J. A. Thorburn.* 375, 116, 112-D8 (1991)
- The Metallicity of RR Lyrae Stars in Baade's Window.** *Alistair R. Walker & Donald M. Terndrup.* 378, 119, 152-D13 (1991)
- Lithium in Halo Stars: Constraining the Effects of Helium Diffusion on Globular Cluster Ages and Cosmology.** *Constantine P. Deliyannis & Pierre Demarque.* 379, 216, 165-F7 (1991)
- Oxygen Abundances in Halo Stars.** *Michael S. Bessell, Ralph S. Sutherland, & Kui Ruan.* 383, L71, 226-E6 (1991)
- STARS: PRE-MAIN-SEQUENCE**
- A Spectroscopic Study of the DR 21 Outflow Source. II. The Vibrational H<sub>2</sub> Line Emission.** *R. P. Garden, T. R. Geballe, I. Gatley, & D. Nadeau.* 366, 474, 8-G1 (1991)
- Infrared Spectroscopy of T Tauri Stars.** *C. Giovanardi, S. Gennari, A. Natta, & R. Stanga.* 367, 173, 14-B11 (1991)
- Young Stellar Objects Detected by IRAS.** *Frank O. Clark.* 75, 611, 9-B5 (1991)
- A Search for Embedded Young Stellar Objects in and near the IC 1396 Complex.** *Richard D. Schwartz, Armen L. Gyulbudaghian, & Bruce A. Wilking.* 370, 263, 50-D9 (1991)
- The High State of the FU Orionis Variable Z Canis Majoris.** *F. V. Hessman, J. Eisloffel, R. Mundt, L. W. Hartmann, W. Herbst, & J. Krautter.* 370, 384, 52-A10 (1991)
- Star Formation and the Nature of Bipolar Outflows.** *Frank H. Shu, Steven P. Ruden, Charles J. Lada, & Susana Lizano.* 370, L31, 53-E1 (1991)
- The Effect of an External Disk on the Orbital Elements of a Central Binary.** *P. Arymowicz, C. J. Clarke, S. H. Lubow, & J. E. Pringle.* 370, L35, 53-E7 (1991)
- Disk Accretion onto Magnetic T Tauri Stars.** *Ariele Königl.* 370, L39, 53-E13 (1991)
- The Spectral Signatures of Collapse and Outflow around Young Stars.** *E. R. Keto.* 371, 163, 62-B3 (1991)
- Near-Infrared Emission-Line Images of Three Herbig-Haro Objects.** *Karl R. Stapelfeldt, Charles A. Beichman, J. Jeff Hester, Nicholas Z. Scoville, & Thomas N. Gautier III.* 371, 226, 63-A1 (1991)
- HH 5, HH 6, and Their Exciting Stars.** *Martin Cohen, Burton F. Jones, & Mark Hereld.* 371, 237, 63-B1 (1991)
- The Ultraviolet Continuum and the Fluorescent H<sub>2</sub> Lines in Low-Excitation Herbig-Haro Objects.** *K.-H. Böhm, D. M. Scott, & J. Solf.* 371, 248, 63-C1 (1991)
- Ambipolar Diffusion, Cloud Cores, and Star Formation: Two-dimensional, Cylindrically Symmetric Contraction. I. The Issues, Formulation of the Problem, and Method of Solution.** *Telemachos Ch. Mouschovias & Scott A. Morton.* 371, 296, 63-G1 (1991)
- Episodic Outflows from High-Mass Protostars.** *G. F. Mitchell, J.-P. Maillard, & T. I. Hasegawa.* 371, 342, 64-D1 (1991)
- An Extremely High Velocity CO Outflow from NGC 7538 IRS 9.** *George F. Mitchell & Tatsuhiko I. Hasegawa.* 371, L33, 66-E1 (1991)
- Multifrequency VLA Observations of Radio Continuum from IRAS 16293–2422.** *R. Estalella, G. Anglada, L. F. Rodriguez, & G. Garay.* 371, 626, 69-C12 (1991)
- Nonlinear Evolution of Accretion Disks Induced by Radiative Feedback Processes.** *K. R. Bell, D. N. C. Lin, & Steven P. Ruden.* 372, 633, 83-E7 (1991)
- Mixing Layers in Stellar Outflows.** *J. Cantó & A. C. Raga.* 372, 646, 83-F7 (1991)
- The Lithium Abundance of the T Tauri Star BP Tauri.** *Douglas K. Duncan.* 373, 250, 89-B1 (1991)
- The Formation of Molecules in Protostellar Winds.** *A. E. Glassgold, G. M. Mamajek, & P. J. Huggins.* 373, 254, 89-B7 (1991)
- The Evolution of Intermediate-Mass Protostars. I. Basic Results.** *Francesco Palla & Steven W. Stahler.* 375, 288, 114-E1 (1991)
- Spectroscopic Study of Direct and Dust-scattered Line Emission in the HH 1–HH 2 System.** *J. Solf & K. H. Böhm.* 375, 618, 120-D3 (1991)
- NGC 1333 IRS 4: A Very Young, Low-Luminosity Binary System.** *Göran Sandell, Colin Aspin, William D. Duncan, Adrian P. G. Russell, & E. Ian Robson.* 376, L17, 130-C1 (1991)
- Observations and Chemistry of Interstellar Refractory Elements.** *B. E. Turner.* 376, 573, 133-E1 (1991)
- A Double Radio Source at the Center of the Outflow in L723.** *Guillem Anglada, Robert Estalella, Luis F. Rodríguez, José M. Torrelles, Rosario López, & Jorge Cano.* 376, 615, 134-A7 (1991)
- Molecular Outflows Associated with Young Stellar Objects in the L1641 Region of Orion.** *James A. Morgan, F. Peter Schloerb, Ronald L. Snell, & John Bally.* 376, 618, 134-A12 (1991)
- Direct VLBI Detection of the Magnetosphere Surrounding the Young Star S1 in  $\rho$  Ophiuchi.** *Philippe André, Robert B. Phillips, Jean-François Lestrade, & Karl-Ludwig Klein.* 376, 630, 134-B12 (1991)
- The LkHα 101 Infrared Cluster.** *M. Barsony, J. M. Schombert, & K. Kis-Halas.* 379, 221, 165-G1 (1991)
- Models for Light Scattering by Dust around Herbig-Haro Objects.** *Alberto Noriega-Crespo, Nuria Calvet, & Karl-Heinz Böhm.* 379, 676, 173-B1 (1991)
- A Rich Cluster of Radio Stars in the  $\rho$  Ophiuchi Cloud Cores.** *James A. Leous, Eric D. Feigelson, Philippe André, & Thierry Monmerle.* 379, 683, 173-B10 (1991)
- Magnetically Driven Jets and Winds.** *R. V. E. Lovelace, H. L. Berk, & J. Contopoulos.* 379, 696, 173-D1 (1991)

- Irradiation of Accretion Disks around Young Objects. I. Near-Infrared CO Bands. *Nuria Calvet, Alberto Patiño, Gladis Magis C., & Paola D'Alessio.* 380, 617, 185-G8 (1991)
- Interstellar Solid CO: Polar and Nonpolar Interstellar Ices. *A. G. G. M. Tielens, A. T. Tokunaga, T. R. Geballe, & F. Baas.* 381, 181, 191-C5 (1991)
- Particle Emissivity in Circumstellar Disks. *Steven V. W. Beckwith & Anneila I. Sargent.* 381, 250, 192-B1 (1991)
- Milliarcsecond Radio Structure of Weak-lined T Tauri Stars. *R. B. Phillips, C. J. Lonsdale, & E. D. Feigelson.* 382, 261, 203-D9 (1991)
- Are FU Orionis Stars Younger than T Tauri Stars? Submillimeter Constraints on Circumstellar Disks. *David A. Weintraub, Göran Sandell, & William D. Duncan.* 382, 270, 203-E8 (1991)
- The Molecular Structure around HL Tauri. *A. I. Sargent & S. V. W. Beckwith.* 382, L31, 205-D6 (1991)
- 10 Micron Spectra of Protostars and the Solid Methanol Abundance. *W. A. Schutte, A. G. G. M. Tielens, & S. A. Sandford.* 382, 523, 208-A11 (1991)
- Asymptotic Theory for the Spatial Distribution of Protostellar Emission. *Fred C. Adams.* 382, 544, 208-C8 (1991)
- Far-Infrared and Submillimeter Wavelength Observations of Star-forming Dense Cores. II. Images. *E. F. Ladd, Fred C. Adams, S. Casey, J. A. Davidson, G. A. Fuller, D. A. Harper, P. C. Myers, & R. Padman.* 382, 555, 208-D7 (1991)
- Optical Excess Emission in T Tauri Stars. *Patrick Hartigan, Scott J. Kenyon, Lee Hartmann, Stephen E. Strom, Susan Edwards, Alan D. Wely, & John Stauffer.* 382, 617, 209-C1 (1991)
- A Nearly Unipolar CO Outflow from the HH 46–47 System. *Lawrence M. Chernin & Colin R. Masson.* 382, L93, 211-E3 (1991)
- Molecular Line Emission Models of Herbig-Haro Objects. I. H<sub>2</sub> Emission. *Mark G. Wolfire & Arieh Königl.* 383, 205, 214-E9 (1991)
- Time-dependent Radio Sources in the Star-forming Region Cepheus A (East). *V.A. Hughes.* 383, 280, 215-F1 (1991)
- Infrared Recombination Lines of Hydrogen from Young Objects in the Southern Galactic Plane. *Sara C. Beck, Jacqueline Fischer, & Howard A. Smith.* 383, 336, 216-D1 (1991)
- The 1.0–1.3 Micron Spectrum of LkHα 101. *Richard J. Rudy, Peter Erwin, George S. Rossano, & R. C. Puetter.* 383, 344, 216-D7 (1991)
- An Optical/Infrared Outburst in the Exciting Source of HH 7–11. *Jochen Eisloffel, Eike Günther, Frederic V. Hessman, Reinhard Mundt, Ralf Poetzel, John S. Carr, Steven Beckwith, & Tom P. Ray.* 383, L19, 219-C7 (1991)
- The Dusty Envelopes of FU Orionis Variables. *Scott J. Kenyon & Lee W. Hartmann.* 383, 664, 222-E1 (1991)
- Two New Molecular Outflows in L1551? *Marc W. Pound & John Bally.* 383, 705, 223-A7 (1991)
- The Vertical Structure of T Tauri Accretion Disks. I. Heating by the Central Star. *Fabien Malbet & Claude Bertout.* 383, 814, 224-D1 (1991)
- STARS: PROPER-MOTION**
- The Proper Motion of the Soft X-Ray-emitting Radio Pulsar PSR 0656+14. *R. J. Thompson, Jr., F. A. Córdova, R. M. Hjellming, & E. B. Fomalont.* 366, L83, 11-E1 (1991)
- ESO 207-61: A Brown Dwarf Candidate in the Hyades Moving Group. *Maria Teresa Ruiz, Marianne Y. Takamiya, & Miguel Roth.* 367, L59, 22-C7 (1991)
- The Radio “Lobes” of Scorpius X-1 Are Unrelated Background Sources. *E. B. Fomalont & B. J. Geldzahler.* 383, 289, 215-G1 (1991)
- STARS: PULSATION**
- Classical Cepheids with RV Tauri Characteristics? *Pawel Moskalik & J. Robert Buchler.* 366, 300, 4-F12 (1991)
- On the Subadiabatic Magnetohydrodynamic Overstability in Background Polytropes. *Yu-Qing Lou.* 367, 367, 16-E9 (1991)
- Stellar Evolution and Period Changes in RR Lyrae Stars. *Young-Wook Lee.* 367, 524, 19-G7 (1991)
- Resonant Interaction in Common Envelopes. *Noam Soker.* 367, 593, 20-F1 (1991)
- Adiabatic Properties of Pulsating DA White Dwarfs. I. The Treatment of the Brunt-Väisälä Frequency and the Region of Period Formation. *P. Brassard, G. Fontaine, F. Wesemael, S. D. Kawaler, & M. Tassoul.* 367, 601, 20-F11 (1991)
- Detection of Possible p-Mode Oscillations on Procyon. *Timothy M. Brown, Ronald L. Gilliland, Robert W. Noyes, & Lawrence W. Ramsey.* 368, 599, 32-E8 (1991)
- Detection of Small-Amplitude Pulsations in HD 34656 (O7 II). *A. W. Fullerton, D. R. Gies, & C. T. Bolton.* 368, L35, 35-C1 (1991)
- Asteroseismology of White Dwarf Stars. I. Adiabatic Results. *P. A. Bradley & D. E. Winget.* 75, 463, 7-A13 (1991)
- Phase Coherence for TeV/PeV Binary Sources. *D. A. Lewis, R. C. Lamb, & S. D. Biller.* 369, 479, 43-F4 (1991)
- The Discovery of an X-Ray Burst and a Study of Aperiodic Variability from SMC X-1. *L. Angelini, L. Stella, & N. E. White.* 371, 332, 64-C1 (1991)
- Opacity Tables for Cepheid Variables. *Carlos A. Iglesias & Forrest J. Rogers.* 371, L73, 73-D1 (1991)
- Two Double-Mode RR Lyrae Stars in the Field. *Christine M. Clement, T. D. Kinman, & Nicholas B. Suntzeff.* 372, 273, 77-C13 (1991)
- Oscillations of Rotating Neutron Stars. *Tod E. Strohmayer.* 372, 573, 82-G5 (1991)
- Classical Cepheid Luminosities from Binary Companions. *Nancy Remage Evans.* 372, 597, 83-B1 (1991)
- The Oscillations of Rapidly Rotating Newtonian Stellar Models. II. Dissipative Effects. *James R. Ipser & Lee Lindblom.* 373, 213, 88-E12 (1991)
- Analysis of Radiation Pressure Effects in Pulsating Stars through Perturbative Limit Cycle Solutions. *A. Costa, D. Gómez, & C. Ferro Fontán.* 373, 237, 88-G13 (1991)
- Single and Binary Star Evolution. *Icko Iben, Jr.* 76, 55, 24-G3 (1991)
- Post-Newtonian Effects on the Modes of Rotating Stars. *Curt Cutler.* 374, 248, 101-C1 (1991)
- The Infrared and Optical Pulsations of G29-38. *Joseph Patterson, B. Zuckerman, E. E. Becklin, D. J. Tholen, & T. Hawarden.* 374, 330, 102-C1 (1991)
- Hydrodynamic Pulsation Models of Yellow Supergiant Stars in the Post-Asymptotic Giant Branch. *Toshiki Aikawa.* 374, 700, 107-F13 (1991)
- The p-Mode Oscillation Spectra of an Evolving 1 M<sub>⊙</sub> Sun-like Star. *D. B. Guenther.* 375, 352, 115-C8 (1991)
- The Shear Modulus of the Neutron Star Crust and Nonradial Oscillations of Neutron Stars. *T. Strohmayer, S. Ogata, H. Iyetomi, S. Ichimaru, & H. M. Van Horn.* 375, 679, 121-B7 (1991)
- Detection of Coherent 7.6 Hz Oscillations during a Burst from Aquila X-1. *R. J. Schoelkopf & R. L. Kelley.* 375, 696, 121-D1 (1991)
- The RRd Masses Revisited. *Norman R. Simon & Arthur N. Cox.* 376, 717, 135-C1 (1991)
- Asteroseismology of the DOV Star PG 1159–035 with the Whole Earth Telescope. *D. E. Winget, R. E. Nather, J. C. Clemens, J. Provencal, S. J. Kleinman, P. A. Bradley, M. A. Wood, C. F. Claver, M. L. Frueh, A. D. Grauer, B. P. Hines, C. J. Hansen, G. Fontaine, N. Achilleos, D. T. Wickramasinghe, T. M. K. Marar, S. Seetha, B. N. Ashoka, D. O'Donoghue, B. Warner, D. W. Kurtz, D. A. Buckley, J. Brickhill, G. Vauclair, N. Dolez, M. Chevreton, M. A. Barstow, J. E. Solheim, A. Kanaan, S. O. Kepler, G. W. Henry, & S. D. Kawaler.* 378, 326, 155-A10 (1991)
- Discovery and Seismological Interpretation of Low-Amplitude Modes in the Pulsating DO White Dwarf PG 1707+427 (V817 Herculis). *G. Fontaine, P. Bergeron, G. Vauclair, P. Brassard, F. Wesemael, S. D. Kawaler, A. D. Grauer, & D. E. Winget.* 378, L49, 162-F1 (1991)
- On the Adiabatic Pulsations of Accretion Disks and Rotating Stars. *James R. Ipser & Lee Lindblom.* 379, 285, 166-E7 (1991)
- Periodic Stellar Pulsations: Stability Analysis and Amplitude Equations. *J. Robert Buchler, Pawel Moskalik, & Géza Kovács.* 380, 185, 178-D1 (1991)
- Superfluid Hydrodynamics in Rotating Neutron Stars. I. Nondissipative Equations. *Gregory Mendell.* 380, 515, 184-F1 (1991)
- Superfluid Hydrodynamics in Rotating Neutron Stars. II. Dissipative Effects. *Gregory Mendell.* 380, 530, 184-G3 (1991)
- Post-Asymptotic Giant Branch Nonradial Instability Strips. *Letizia Stanghellini, Arthur N. Cox, & Sumner Starrfield.* 383, 766, 223-F10 (1991)
- The Mode of Pulsation in Mira Variables Determined by the Observed Acceleration Data. *Y. Tuchman.* 383, 779, 223-G11 (1991)

**STARS: RADIO RADIATION**

- AG Pegasi: A Multishell Radio Source.** *H. T. Kenny, A. R. Taylor, & E. R. Seaquist.* 366, 549, 9-G7 (1991)
- The Proper Motion of the Soft X-Ray-emitting Radio Pulsar PSR 0656+14.** *R. J. Thompson, Jr., F. A. Córdova, R. M. Hjelming, & E. B. Fomalont.* 366, L83, 11-E1 (1991)
- Nonthermal Radio Emission from the X-Ray-Bright K5 IV Star 1E 1751+7046.** *Stephen L. Skinner.* 368, 272, 26-D11 (1991)
- Solar and Stellar Radio Spikes: Limits on the Saturation of the Electron-Cyclotron Maser.** *Donat G. Wentzel & Markus J. Aschwanden.* 372, 688, 84-C1 (1991)
- Direct VLBI Detection of the Magnetosphere Surrounding the Young Star S1 in  $\rho$  Ophiuchi.** *Philippe André, Robert B. Phillips, Jean-François Lestrade, & Karl-Ludwig Klein.* 376, 630, 134-B12 (1991)
- Observations of Stellar Winds from Hot Stars at 1.3 Millimeters.** *Claus Leitherer & Carmelle Robert.* 377, 629, 147-E1 (1991)
- High-Resolution Radio Continuum Observations of Compact Planetary Nebulae.** *O. B. Aaquist & Sun Kwok.* 378, 599, 159-G1 (1991)
- An Observational Connection between Circumstellar Disk Mass and Molecular Outflows.** *Sylvie Cabrit & Philippe André.* 379, L25, 169-C6 (1991)
- A Rich Cluster of Radio Stars in the  $\rho$  Ophiuchi Cloud Cores.** *James A. Leous, Eric D. Feigelson, Philippe André, & Thierry Montmerle.* 379, 683, 173-B10 (1991)
- The 10 Year Radio Light Curves for SN 1979C.** *Kurt W. Weiler, Schuyler D. Van Dyk, Nino Panagia, Richard A. Sramek, & Jennifer L. Discenna.* 380, 161, 178-B1 (1991)
- Milliarcsecond Radio Structure of Weak-lined T Tauri Stars.** *R. B. Phillips, C. J. Lonsdale, & E. D. Feigelson.* 382, 261, 203-D9 (1991)
- Are FU Orionis Stars Younger than T Tauri Stars? Submillimeter Constraints on Circumstellar Disks.** *David A. Weintraub, Göran Sandell, & William D. Duncan.* 382, 270, 203-E8 (1991)
- Direct Evidence for Stellar Wind X-Ray Absorption in O Stars.** *Wayne L. Waldron.* 382, 603, 209-A9 (1991)
- The Radio "Lobes" of Scorpius X-1 Are Unrelated Background Sources.** *E. B. Fomalont & B. J. Geldzahler.* 383, 289, 215-G1 (1991)
- STARS: ROTATION**
- Rotation and Magnetism in White Dwarfs.** *Gary D. Schmidt & Jane E. Norwrothy.* 366, 270, 4-D1 (1991)
- Evolutionary Models of Halo Stars with Rotation. I. Evidence for Differential Rotation with Depth in Stars.** *Marc H. Pinsonneault, Constantine P. Delyannis, & Pierre Demarque.* 367, 239, 15-A12 (1991)
- Models of White Dwarfs under Rapid Uniform or Differential Rotation: Numerical Results. II.** *V. S. Geroyannis & A. A. Hadjopoulos.* 75, 499, 7-D11 (1991)
- Continuum Polarization by Electron Scattering in Rotationally Distorted, Radiation-driven Stellar Winds: B[e] Supergiants.** *Cameron J. Boyd & J. M. Marlborough.* 369, 191, 38-C11 (1991)
- Explosion of a Rotating Neutron Star near the Minimum Mass.** *Monica Colpi, Stuart L. Shapiro, & Saul A. Teukolsky.* 369, 422, 43-A5 (1991)
- Does Accretion Cease When a Star Approaches Breakup?** *Robert Popham & Ramesh Narayan.* 370, 604, 56-A6 (1991)
- Meridional Circulation and Diffusion in A and Early F Stars.** *Paul Charbonneau & Georges Michaud.* 370, 693, 57-A10 (1991)
- Spectroscopic Binaries in the Orion OB1 Association.** *Nidia Morrell & Hugo Levato.* 75, 965, 15-F5 (1991)
- Oscillations of Rotating Neutron Stars.** *Tod E. Strohmayer.* 372, 573, 82-G5 (1991)
- Rotational Modulation in JUE Spectra of Cool Dwarf Chromospheres. I. Data Analysis and Period Search Techniques.** *K. L. Hallam, B. Altner, & A. S. Endal.* 372, 610, 83-C1 (1991)
- Stationary Accelerators around Keplerian Disks of Aligned Magnetized Collapsed Objects: Pair Production and Gamma-Ray Emission.** *K. S. Cheng & M. Ruderman.* 373, 187, 88-C9 (1991)
- The Oscillations of Rapidly Rotating Newtonian Stellar Models. II. Dissipative Effects.** *James R. Ipser & Lee Lindblom.* 373, 213, 88-E12 (1991)
- Structure and Stability of Rotating Relativistic Neutron Stars.** *F. Weber, N. K. Glendenning, & M. K. Weigel.* 373, 579, 95-B10 (1991)
- The Chromospheric Activity of Low-Mass Stars in the Hyades.** *John R. Stauffer, Mark S. Giampapa, William Herbst, James M. Vincent, Lee W. Hartmann, & Robert A. Stern.* 374, 142, 99-G1 (1991)
- Post-Newtonian Effects on the Modes of Rotating Stars.** *Curt Cutler.* 374, 248, 101-C1 (1991)
- The Collapse of Cylindrical Isothermal and Polytropic Clouds with Rotation.** *Ian Bonnell & Pierre Bastien.* 374, 610, 106-F5 (1991)
- Rotation and Emission Lines in Stars and Accretion Disks.** *Keith Horne & Steven H. Saar.* 374, L55, 110-D11 (1991)
- V1500 Cygni: A Prediction.** *J. I. Katz.* 374, L59, 110-D11 (1991)
- The Many Faces of F Stars: A Rotational Modulation Study of Capella, Procyon, and Caph with the International Ultraviolet Explorer.** *Thomas R. Ayres.* 375, 704, 121-D11 (1991)
- Rotational Evolution of Solar-Type Stars. I. Main-Sequence Evolution.** *K. B. MacGregor & M. Brenner.* 376, 204, 127-D13 (1991)
- Spin Evolution and Magnetic Fields in Cataclysmic Variables.** *Andrew R. King & Jean-Pierre Lasota.* 378, 674, 160-G1 (1991)
- On the Adiabatic Pulsations of Accretion Disks and Rotating Stars.** *James R. Ipser & Lee Lindblom.* 379, 285, 166-E7 (1991)
- Spin-up of the White Dwarf in the Intermediate Polar 3A 0729+103.** *Jyoti Singh, P. C. Agrawal, K. M. V. Apparao, P. Vivekananda Rao, & M. B. K. Sarma.* 380, 208, 178-E11 (1991)
- Metallic Line Profiles of the A0 V Star Vega.** *Austin F. Gulliver, Saul J. Adelman, Charles R. Cowley, & J. Murray Fletcher.* 380, 223, 178-G1 (1991)
- Superfluid Hydrodynamics in Rotating Neutron Stars. I. Nondissipative Equations.** *Gregory Mendell.* 380, 515, 184-F1 (1991)
- Superfluid Hydrodynamics in Rotating Neutron Stars. II. Dissipative Effects.** *Gregory Mendell.* 380, 530, 184-G3 (1991)
- A Connection between Long-Term Luminosity Variations and Orbital Period Changes in Chromospherically Active Binaries.** *Douglas S. Hall.* 380, L85, 188-F1 (1991)
- Two-dimensional Hydrodynamic Calculations of the Nonlinear Development of the Goldreich-Schubert-Fricke Instability in a Rotating Annulus.** *D. G. Korycansky.* 381, 515, 197-B1 (1991)
- Rotation Periods for Seven Stars in the Trapezium Cluster.** *Gregory N. Mandel & William Herbst.* 383, L75, 226-E11 (1991)
- Model Atmospheres for Rotating B Stars.** *George W. Collins II, Ryland J. Truax, & Steven R. Cranmer.* 77, 541, 52-B5 (1991)
- STARS: SEMIREGULAR VARIABLES**
- Abundances of Tc and Related Elements in Stars of Type M, MS, and S.** *Andrew D. Vanture, George Wallerstein, Jeffery A. Brown, & Grant Basan.* 381, 278, 192-D7 (1991)
- STARS: SPECTRA**
- The Diffuse Interstellar Bands. VIII. New Features between 6000 and 8650 Å.** *G. H. Herbig & K. D. Leka.* 382, 193, 202-E12 (1991)
- STARS: SPECTRAL CLASSIFICATION**
- Criteria for the Spectral Classification of B Stars in the Ultraviolet.** *Janet Rountree & George Sonneborn.* 369, 515, 44-B5 (1991)
- Classical Cepheid Luminosities from Binary Companions.** *Nancy Remage Evans.* 372, 597, 83-B1 (1991)
- The Evolution and Classification of Postoutburst Novae Spectra.** *R. E. Williams, M. Hamuy, M. M. Phillips, S. R. Heathcoat, Lisa Wells, & M. Narvárete.* 376, 721, 135-C7 (1991)
- A Standard Stellar Spectral Sequence in the Red/Near-Infrared: Classes K5 to M9.** *J. Davy Kirkpatrick, Todd J. Henry, & Donald W. McCarthy, Jr.* 77, 417, 50-C5 (1991)
- New Low-Resolution Spectrometer Spectra for IRAS Sources.** *Kevin Volk, Sun Kwok, R. E. Stencel, & E. Brugel.* 77, 607, 53-A1 (1991)
- STARS: STELLAR DYNAMICS**
- Hamiltonian Dynamics of Self-gravitating Ellipsoids.** *G. Rosensteel & Huy Q. Tran.* 366, 30, 1-D9 (1991)
- Multicomponent Models for the Dynamic Evolution of Globular Clusters.** *Hyung Mok Lee, Gregory G. Fahman, & Harvey B. Richer.* 366, 455, 8-E1 (1991)
- On the Orbital Period Change of the Binary Pulsar PSR 1913+16.** *Thibault Damour & J. H. Taylor.* 366, 501, 9-C1 (1991)
- Spectroscopic Binaries in the Orion Nebula Cluster.** *Helmut A. Abt, Ruyou Wang, & Octavio Cardona.* 367, 155, 14-A1 (1991)

- The Galactic Disk Surface Mass Density and the Galactic Force  $K_z$  at  $z = 1.1$  Kiloparsecs.** *Konrad Kuijken & Gerard Gilmore.* 367, L9, 17-C1 (1991)
- Zero Central Density Solutions of the Anisotropic Jeans Equation and Neutrino Dark Matter.** *Jes Madsen.* 367, 507, 19-F1 (1991)
- A Search for Instability in Two Families of Spherical Stellar Models.** *Martin D. Weinberg.* 368, 66, 24-A1 (1991)
- Extended Stellar Hydrodynamics for Galactic Disks.** *Peter Amendt & Phil Cuddeford.* 368, 79, 24-B1 (1991)
- The Ring Instability in Radially Cold Oblate Galaxy Models.** *Tim de Zeeuw & Martin Schwarzschild.* 369, 57, 36-F7 (1991)
- A Stability Criterion for Any Collisionless Stellar Equilibrium and Some Concrete Applications Thereof.** *Henry E. Kandrup.* 370, 312, 51-B6 (1991)
- Fokker-Planck Calculations of Star Clusters with Primordial Binaries.** *Bin Gao, Jeremy Goodman, Haldan Cohn, & Brian Murphy.* 370, 567, 55-E1 (1991)
- Gravity in One Dimension: A Correction for Ensemble Averaging.** *Charles J. Reidl, Jr., & Bruce N. Miller.* 371, 260, 63-D1 (1991)
- Angular Momentum and Stripping in Tidal Interactions.** *Thomas A. McGlynn & Kirk D. Borne.* 372, 31, 74-D7 (1991)
- Star Cluster Evolution with Primordial Binaries. II. Detailed Analysis.** *Steve McMillan, Piet Hut, & Junichiro Makino.* 372, 111, 75-D5 (1991)
- Further Limits on Disklike Dark Matter from K Dwarf Kinematics.** *Konrad Kuijken.* 372, 125, 75-E7 (1991)
- The Stability of Cold, Flattened, Self-gravitating Disks Obeying Other than Newtonian Force Laws.** *Dimitris M. Christodoulou.* 372, 471, 81-F1 (1991)
- Vertical Oscillation of the Galactic Disk.** *Martin D. Weinberg.* 373, 391, 92-G7 (1991)
- Orbital Decay in Aspherical Galaxies. II. Triaxial Systems.** *Thomas S. Statler.* 375, 544, 119-E1 (1991)
- What Damps Small Perturbations in Stellar Systems?** *Eyal Maoz.* 375, 687, 121-C1 (1991)
- Stability of Nonrotating Stellar Systems. II. Prolate Shell-Orbit Models.** *David Merritt & Lars Hernquist.* 376, 439, 131-G13 (1991)
- Modes of Oscillation of a Uniformly Rotating, Homogeneous Spheroid of Stars.** *Peter O. Vandervoort.* 377, 49, 138-F1 (1991)
- Collisions of Giant Stars with Compact Objects: Hydrodynamical Calculations.** *Frederic A. Rasio & Stuart L. Shapiro.* 377, 559, 146-F1 (1991)
- Hydrodynamics of Collisions between Binary Stars.** *Jeremy Goodman & Lars Hernquist.* 378, 637, 160-C11 (1991)
- Absolute Magnitudes and Kinematic Properties of Cepheids.** *Teresa D. Wilson, Thomas G. Barnes III, Suzanne L. Hawley, & William H. Jefferys.* 378, 708, 161-B11 (1991)
- Population Studies. X. Constraints on the Mass and Extent of the Galaxy's Dark Corona.** *John E. Norris & M. R. S. Hawkins.* 380, 104, 177-C11 (1991)
- The Secular Instability of Axisymmetric Collisionless Star Clusters.** *Henry E. Kandrup.* 380, 511, 184-E9 (1991)
- The Statistics of Slow Interstellar Accretion onto Neutron Stars.** *O. Blaes & M. Rajagopal.* 381, 210, 191-E10 (1991)
- Stellar Encounters Involving Red Giants in Globular Cluster Cores.** *M. B. Davies, W. Benz, & J. G. Hills.* 381, 449, 196-C7 (1991)
- The Ordered Nature of Elliptical Galaxies: Implications for Their Intrinsic Angular Momenta and Shapes.** *Marijn Franx, Garth Illingworth, & Tim de Zeeuw.* 383, 112, 213-D7 (1991)
- On Core Collapse.** *Junichiro Makino & Piet Hut.* 383, 181, 214-C9 (1991)
- The Formation of Primordial Binaries in Globular Clusters by Star-Disk Interactions.** *Stephen D. Murray, C. J. Clarke, & J. E. Pringle.* 383, 192, 214-D7 (1991)
- On the Effects of Interstellar Gas on the Oscillations and the Stability of Galaxies.** *Peter O. Vandervoort.* 383, 498, 220-E1 (1991)
- Two High-Velocity Stars Shot Out from the Core of the Globular Cluster 47 Tucanae.** *G. Meylan, P. Dubath, & M. Mayor.* 383, 587, 221-E4 (1991)
- STAR: STELLAR STATISTICS**
- Star Formation in Taurus-Auriga: The High-Mass Stars.** *Frederick M. Walter & William T. Boyd.* 370, 318, 51-C1 (1991)
- On the Explosion in a Common Envelope Scenario for Type Ia Supernovae.** *James H. Applegate.* 370, 324, 51-C9 (1991)
- Further Limits on Disklike Dark Matter from K Dwarf Kinematics.** *Konrad Kuijken.* 372, 125, 75-E7 (1991)
- The Structure and Evolution of Rich Star Clusters in the Large Magellanic Cloud.** *Rebecca A. W. Elson.* 76, 185, 26-E9 (1991)
- Gravitational Microlensing of High-Redshift Supernovae by Compact Objects.** *Kevin P. Rauch.* 374, 83, 99-A11 (1991)
- Limits on the Space Density of Double Degenerates as Type Ia Supernova Progenitors.** *Diana Foss, Richard A. Wade, & Richard F. Green.* 374, 281, 101-E9 (1991)
- Detection of a Galactic Color Gradient for Blue Horizontal-Branch Stars of the Halo Field and Implications for the Halo Age and Density Distributions.** *George W. Preston, Stephen A. Shectman, & Timothy C. Beers.* 375, 121, 112-E1 (1991)
- On the Formation of Globular Clusters. I. Dynamical Limits on Globular Cluster Metallicities.** *J. H. Brown, A. Burkert, & James W. Thrane.* 376, 115, 126-D1 (1991)
- The White Dwarf Mass Distribution in Classical Nova Systems.** *Hans Ritter, Michael Politano, Mario Livio, & Ronald F. Webbink.* 376, 177, 127-B10 (1991)
- Metallicity and Velocity Distribution of Giants toward the Galactic Poles.** *Kavan U. Ratnatunga & Kenneth M. Yoss.* 377, 442, 145-C3 (1991)
- STARS: S-TYPE**
- An Interactive Companion to the S Star HD 35155.** *Thomas B. Ake III, Hollis R. Johnson, & Mudhaffer M. Ameen.* 383, 842, 224-F7 (1991)
- STARS: SUBDWARFS**
- First Results from the Goddard High-Resolution Spectrograph: Evidence for Photospheric Microturbulence in Early O Stars: Are Surface Gravities Systematically Underestimated?** *I. Hubeny, S. R. Heap, & B. Altenor.* 377, L33, 143-D11 (1991)
- STARS: SUPERGIANTS**
- Nonthermal X-Ray Emission from Winds of OB Supergiants.** *Wen Chen & Richard L. White.* 366, 512, 9-D1 (1991)
- Continuum Polarization by Electron Scattering in Rotationally Distorted, Radiation-driven Stellar Winds: B[e] Supergiants.** *Cameron J. Boyd & J. M. Marlborough.* 369, 191, 38-C11 (1991)
- Multicolor CCD Imaging of Supergiants in the Disk of NGC 253.** *T. J. Davidge, O. Le Feuvre, & C. C. Clark.* 370, 559, 55-D7 (1991)
- A Windswept Cometary Tail on the Galactic Center Supergiant IRS 7.** *F. Yusef-Zadeh & Mark Morris.* 371, L59, 73-B10 (1991)
- Blue Loops during Core Helium Burning as the Consequence of Moderate Convective Envelope Overshooting in Stars of Intermediate to High Mass.** *Richard B. Stothers & Chao-wen Chin.* 374, 288, 101-F3 (1991)
- Hydrodynamic Pulsation Models of Yellow Supergiant Stars in the Post-Asymptotic Giant Branch.** *Toshiki Aikawa.* 374, 700, 107-F13 (1991)
- UBV Photometry of OB<sup>+</sup> Stars in the Southern Milky Way.** *J. S. Drilling.* 76, 1033, 39-C11 (1991)
- A Gaseous Tail Ablated from the Supergiant IRS 7 near the Galactic Center.** *E. Serabyn, J. H. Lacy, & J. M. Achtermann.* 378, 557, 159-C9 (1991)
- LMC-2 as the Blowout of a Hot Superbubble.** *Qingde Wang & David J. Helfand.* 379, 327, 167-B5 (1991)
- On the Sodium Excess in the Atmospheres of Yellow Supergiants.** *N. Prantzos, A. Coc, & J. P. Thibaud.* 379, 729, 173-G1 (1991)
- High-Mass Stars with Degenerate Neutron Cores.** *Garrett T. Biehle.* 380, 167, 178-B9 (1991)
- Cocoon Stars in the Large Magellanic Cloud.** *Neill Reid.* 382, 143, 202-A4 (1991)
- First Ultraviolet Spectropolarimetry of Hot Supergiants.** *M. Taylor, A. D. Code, K. H. Nordsieck, C. M. Anderson, B. L. Babler, K. S. Bjorkman, G. C. Clayton, A. M. Magalhães, M. R. Meade, R. E. Schulte-Ladbeck, & B. A. Whitney.* 382, L85, 211-D5 (1991)
- STARS: SUPERNOVAE**
- On the [O/Fe] versus [Fe/H] Relationship and the Progenitors of Type I Supernovae.** *C. Abia, R. Canal, & J. Isern.* 366, 198, 3-E1 (1991)

- Using SN 1987A Light Echoes to Determine Mass Loss from the Progenitor.** Arlin P. S. Croots & William E. Kunkel. 366, L73, 11-D1 (1991)
- Measurements of the Diameter of the Supernova SN 1987A.** M. Karovska, P. Nisenson, C. Standley, & S. R. Heathcote. 367, L15, 17-C8 (1991)
- Instabilities and Clumping in SN 1987A. I. Early Evolution in Two Dimensions.** Bruce Fryxell, Ewald Müller, & David Arnett. 367, 619, 21-A5 (1991)
- Zero Point of the Supernova Hubble Diagram.** M. Fukugita & C. J. Hogan. 368, L11, 28-C1 (1991)
- The Dynamic Instability of Adiabatic Blast Waves.** Dongsu Ryu & Ethan T. Vishniac. 368, 411, 30-B12 (1991)
- Gamma-Ray Lines from Type I Supernovae.** K. W. Chan & R. E. Lingefelter. 368, 515, 31-E1 (1991)
- Rayleigh-Taylor Instabilities and Mixing in the Helium Star Models for Type Ib/Ic Supernovae.** Izumi Hachisu, Takuya Matsuda, Ken'ichi Nomoto, & Toshikazu Shigeyama. 368, L27, 35-B4 (1991)
- <sup>57</sup>Co and <sup>44</sup>Ti Production in SN 1987A.** S. E. Woosley & Robert D. Hoffman. 368, L31, 35-B10 (1991)
- Evolution of the Interstellar Medium in Elliptical Galaxies. II. X-Ray Properties.** L. P. David, W. Forman, & C. Jones. 369, 121, 37-D9 (1991)
- First Results from the Faint Object Camera: SN 1987A.** P. Jakobsen, R. Albrecht, C. Barbieri, J. C. Blades, A. Boksenberg, P. Crane, J. M. Deharveng, M. J. Disney, T. M. Kamperman, I. R. King, F. Macchetto, C. D. Mackay, F. Paresce, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, W. B. Sparks, R. P. Kirshner, & N. Panagia. 369, L63, 46-B1 (1991)
- Numerical Simulations of Off-Center Detonations in Helium Shells.** Eli Livne & Ami S. Glasner. 370, 272, 50-E12 (1991)
- On the Explosion in a Common Envelope Scenario for Type Ia Supernovae.** James H. Applegate. 370, 324, 51-C9 (1991)
- A Large Supershell H II Region Complex in the Large Magellanic Cloud and the Interstellar Environment of SN 1987A.** Frederick C. Bruhweiler, Michelle A. Fitzurka, & Theodore R. Gull. 370, 551, 55-C9 (1991)
- Helium Star Cataclysmics.** Icko Iben, Jr., & Alexander V. Tutukov. 370, 615, 56-B5 (1991)
- Shock Waves and Nucleosynthesis in Type II Supernovae.** M. B. Aufreheide, E. Baron, & F.-K. Thielemann. 370, 630, 56-C8 (1991)
- Hydrodynamical Instabilities and Mixing in SN 1987A: Two-dimensional Simulations of the First 3 Months.** Marc Herant & Willy Benz. 370, L81, 59-D6 (1991)
- He Stars and He-accreting CO White Dwarfs.** Marco Limongi & Amedeo Tornambé. 371, 317, 64-A9 (1991)
- Premaximum Observations of the Type Ia SN 1990N.** Bruno Leibundgut, Robert P. Kirshner, Alexei V. Filippenko, Joseph C. Shields, Craig B. Foltz, Mark M. Phillips, & George Sonneborn. 371, L23, 66-D1 (1991)
- The Young Supernova Remnants N132D and 1E 0102.2–7219: Limits on the Presence of Rapidly Moving Sulfur.** Barry M. Lasker & David A. Golimowski. 371, 568, 68-E8 (1991)
- The Shock Process and Light-Element Production in Supernova Envelopes.** Lawrence E. Brown, David S. Dearborn, David N. Schramm, Jon T. Larsen, & Shin Kurokawa. 371, 648, 69-F1 (1991)
- s-Process Nucleosynthesis in Massive Stars and the Weak Component. II. Carbon Burning and Galactic Enrichment.** C. M. Raiteri, M. Busso, R. Gallino, & G. Picchio. 371, 665, 69-G6 (1991)
- Aberration and Advection Effects in Expanding Spherically Symmetric Shells.** A. Peraiah. 371, 673, 70-A1 (1991)
- Nuclear Reaction Rates in Dense Carbon-Oxygen Mixtures.** Shuji Ogata, Hiroshi Iyetomi, & Setsuo Ichimaru. 372, 259, 77-B9 (1991)
- Spectra of Two Very Old Supernovae: SN 1986J and SN 1980K.** Bruno Leibundgut, Robert P. Kirshner, Philip A. Pinto, Michael P. Rupen, R. Chris Smith, James E. Gunn, & Donald P. Schneider. 372, 531, 82-D1 (1991)
- The Outcome of Explosive Ignition of ONeMg Cores: Supernovae, Neutron Stars, or "Iron" White Dwarfs?** Jordi Isern, Ramon Canal, & Javier Llabay. 372, L83, 85-D9 (1991)
- A New Site for the Astrophysical Gamma-Process.** W. Michael Howard, Bradley S. Meyer, & S. E. Woosley. 373, L5, 91-B1 (1991)
- Hot Gas Metallicity and the History of Supernova Activity in Elliptical Galaxies.** Michael Loewenstein & William G. Mathews. 373, 445, 93-D11 (1991)
- Ionization by High-Energy Particles and the Electron Scattering Opacity in Supernovae.** Douglas A. Swartz. 373, 604, 95-D11 (1991)
- Gravitational Microlensing of High-Redshift Supernovae by Compact Objects.** Kevin P. Rauch. 374, 83, 99-A11 (1991)
- Model Light Curves of Linear Type II Supernovae.** Douglas A. Swartz, J. Craig Wheeler, & Robert P. Harkness. 374, 266, 101-D7 (1991)
- Limits on the Space Density of Double Degenerates as Type Ia Supernova Progenitors.** Diana Foss, Richard A. Wade, & Richard F. Green. 374, 281, 101-E9 (1991)
- Expansion of a Superbubble in a Uniform Magnetic Field.** Katia M. Ferrière, Mordecai-Mark Mac Low, & Ellen G. Zweibel. 375, 239, 114-A4 (1991)
- Analysis of SN 1987A Polarimetry.** David J. Jeffery. 375, 264, 114-C5 (1991)
- Steady Spherical Hypercritical Accretion onto Neutron Stars.** John C. Houck & Roger A. Chevalier. 376, 234, 127-G6 (1991)
- Winds, Outflows, and Inflows in X-Ray Elliptical Galaxies. I.** Luca Ciotti, Annibale D'Ercole, Silvia Pellegrini, & Alvio Renzini. 376, 380, 131-B12 (1991)
- Neutrino-Nucleus Interactions in Core-Collapse Supernovae.** Stephen W. Bruenn & W. C. Paxton. 376, 678, 134-G1 (1991)
- High-Temperature Neutrino-Nucleus Processes in Stellar Collapse.** George M. Fuller & Bradley S. Meyer. 376, 701, 135-A12 (1991)
- Continuum Opacity Produced by Spectral Lines in Supernovae and Similar Explosions.** Robert V. Wagoner, Christopher A. Perez, & Mary Vasu. 377, 639, 147-E12 (1991)
- The Near-Maximum-Light Spectrum of the Type Ic Supernova 1987M.** David J. Jeffery, David Branch, Alexei V. Filippenko, & Ken'ichi Nomoto. 377, L89, 150-D10 (1991)
- SN 1988A in M58: Departure from <sup>56</sup>Co Decay 700 Days after Explosion.** P. Ruiz-Lapuente, M. Kidger, G. Gómez, R. Canal, & R. López. 378, L41, 162-E1 (1991)
- SN 1991T: Gamma-Ray Observatory's First Supernova?** Adam Burrows, Anurag Shankar, & Kenneth A. Van Riper. 379, L7, 169-B1 (1991)
- The Late-Time Light Curve of SN 1984L.** Douglas A. Swartz & J. Craig Wheeler. 379, L13, 169-B7 (1991)
- The Circumstellar Shell of SN 1987A.** Ding Luo & Richard McCray. 379, 659, 172-G9 (1991)
- The Radio Recovery of SN 1970G in M101.** John J. Cowan, W. M. Goss, & R. A. Sramek. 379, L49, 175-B5 (1991)
- The 10 Year Radio Light Curves for SN 1979C.** Kurt W. Weiler, Schuyler D. Van Dyk, Nino Panagia, Richard A. Sramek, & Jennifer L. Discenna. 380, 161, 178-B1 (1991)
- Effects of Aberration and Advection on Line Formation.** A. Peraiah. 380, 212, 178-F1 (1991)
- Properties of the SN 1987A Circumstellar Ring and the Distance to the Large Magellanic Cloud.** N. Panagia, R. Gilmozzi, F. Macchetto, H.-M. Adorf, & R. P. Kirshner. 380, L23, 181-D1 (1991)
- Circumstellar Emission from SN 1987A.** Peter Lundqvist & Claes Fransson. 380, 575, 185-D1 (1991)
- Infrared Hot Spots in the Nucleus of NGC 253.** Duncan A. Forbes, Martin J. Ward, & D. L. DePoy. 380, L63, 188-C6 (1991)
- Diffusion Processes in the Collapse of a Radiating Spherical Body.** R. Chan, L. Herrera, J. A. F. Pacheco, & N. O. Santos. 382, 255, 203-D1 (1991)
- Catalog of SN 1987A Polarimetry Corrected for Interstellar Polarization.** David J. Jeffery. 377, 405, 50-B5 (1991)
- Rayleigh-Taylor Instability in the Asymmetric Supernova Explosion.** Shoichi Yamada & Katsuhiko Sato. 382, 594, 208-G12 (1991)
- Nonthermal Excitation of Helium in Type Ib Supernovae.** L. B. Lucy. 383, 308, 216-A8 (1991)
- STARS: SYMBIOTIC**
- AG Pegasi: A Multishell Radio Source.** H. T. Kenny, A. R. Taylor, & E. R. Sequist. 366, 549, 9-G7 (1991)
- Energy Distribution of Symbiotic Novae.** Greg L. Bryan & Sun Kwok. 368, 252, 26-C1 (1991)

**First Results from the Faint Object Camera: Imaging the Core of R Aquarii.** *F. Paresce, R. Albrecht, C. Barbieri, J. C. Blades, A. Boksenberg, P. Crane, J. M. Deharveng, M. J. Disney, P. Jakobsen, T. M. Kamperman, I. R. King, F. Macchietto, C. D. Mackay, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, & W. B. Sparks.* 369, L67, 46-B7 (1991)

**Narrow-Band Imaging of the Inner R Aquarii Nebula: Further Evidence for Shock Excitation.** *Denis Burgarella & Francesco Paresce.* 370, 590, 55-G1 (1991)

**Observations of the Peculiar Object MWC 560 in Outburst.** *A. G. Michalitsianos, S. P. Maran, R. J. Oliverson, B. Bopp, E. Kontizas, A. Dapergolas, & M. Kontizas.* 371, 761, 71-A7 (1991)

**The Ultraviolet Spectrum of KX Trianguli Australis.** *Walter A. Feibelman.* 375, 335, 115-A12 (1991)

#### STARS: RV TAURI

**Classical Cepheids with RV Tauri Characteristics?** *Pawel Moskalik & J. Robert Buchler.* 366, 300, 4-F12 (1991)

**Period Changes and Evolution in RV Tauri Stars.** *John R. Percy, Dimitar D. Sasselov, Amy Alfred, & Greg Scott.* 375, 691, 121-C7 (1991)

#### STARS: VARIABLES

**A Search for Periodicities in the X-Ray Emission from Cataclysmic Variables.** *Michael Eracleous, Joseph Patterson, & Jules Halpern.* 370, 330, 51-D1 (1991)

**Gravitational Microlensing of the Galactic Bulge Stars.** *B. Paczyński.* 371, L63, 73-C4 (1991)

**Nonlinear Evolution of Accretion Disks Induced by Radiative Feedback Processes.** *K. R. Bell, D. N. C. Lin, & Steven P. Ruden.* 372, 633, 83-E7 (1991)

**The Extraordinary 1989 December 14/15 Optical Flare Events on V711 Thuri.** *Gregory W. Henry & Douglas S. Hall.* 373, L9, 91-B7 (1991)

**Gravitational Microlensing by Double Stars and Planetary Systems.** *Shude Mao & Bohdan Paczyński.* 374, L37, 110-B11 (1991)

**Shot Model Parameters for Cygnus X-1 through Phase Portrait Fitting.** *James C. Lochner, J. H. Swank, & A. E. Szymkowiak.* 376, 295, 128-E9 (1991)

**A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope.** *S. O. Kepler, D. E. Winget, R. E. Nather, P. A. Bradley, A. D. Grauer, G. Fontaine, P. Bergeron, G. Vauclair, C. F. Claver, T. M. K. Maras, S. Seetha, B. N. Ashoka, T. Mazeh, E. Leibowitz, N. Dolez, M. Chevreton, M. A. Barstow, J. C. Clemens, S. J. Kleinman, A. E. Sansom, R. W. Tweedy, A. Kanaan, B. P. Hine, J. L. Provencal, F. Wesemael, M. A. Wood, P. Brassard, J.-E. Solheim, & P.-I. Emanuelsen.* 378, L45, 162-E7 (1991)

**Excitation of the Hydroxyl Maser in OH/IR Stars.** *Dale F. Dickinson.* 379, L29, 169-C11 (1991)

**A Connection between Long-Term Luminosity Variations and Orbital Period Changes in Chromospherically Active Binaries.** *Douglas S. Hall.* 380, L85, 188-F1 (1991)

**Masses of RRab Variables Using Livermore OPAL Opacities.** *Arthur N. Cox.* 381, L71, 199-F1 (1991)

**High-Speed Multicolor Photometry of V834 Centaurus.** *John Middlecamp, James N. Imamura, Michael T. Wolff, & Thomas Y. Steiman-Cameron.* 382, 315, 204-B1 (1991)

#### STARS: VISUAL MULTIPLES

**Classical Cepheid Luminosities from Binary Companions.** *Nancy Remage Evans.* 372, 597, 83-B1 (1991)

**Gravitational Redshift Determinations for White Dwarfs in Common Proper-Motion Binaries.** *Gary Wegner & I. Neill Reid.* 375, 674, 121-B1 (1991)

**The Chromospheric Emission-Age Relation for Stars of the Lower Main Sequence and Its Implications for the Star Formation Rate.** *David R. Soderblom, Douglas K. Duncan, & Dean R. H. Johnson.* 375, 722, 121-F5 (1991)

#### STARS: WURSAE MAJORIS

**Analysis and Solution of the Light and Radial Velocity Curves of the Contact Binary TY Bootis.** *E. F. Milone, G. Groisman, D. J. I. Fry, & D. H. Bradstreet.* 370, 677, 56-G5 (1991)

**The Ultraviolet Light Curves of W Ursae Majoris.** *Albert P. Linnell.* 379, 338, 167-C3 (1991)

#### STARS: WEAK-LINE

**Lithium in the Most Extreme Halo Stars; Trends with Metallicity.** *Constantine P. Deliyannis & Pierre Demarque.* 370, L89, 59-E5 (1991)

**Detection of a Galactic Color Gradient for Blue Horizontal-Branch Stars of the Halo Field and Implications for the Halo Age and Density Distributions.** *George W. Preston, Stephen A. Shectman, & Timothy C. Beers.* 375, 121, 112-E1 (1991)

**Photoelectric UVB Photometry of Stars Selected in the HK Objective-Prism Survey.** *George W. Preston, Stephen A. Shectman, & Timothy C. Beers.* 76, 1001, 38-G5 (1991)

**First Detection of Beryllium in a Very Metal Poor Star: A Test of the Standard Big Bang Model.** *Gerard Gilmore, Bengt Edvardsson, & P. E. Nissen.* 378, 17, 151-C1 (1991)

#### STARS: WHITE DWARFS

**Rotation and Magnetism in White Dwarfs.** *Gary D. Schmidt & Jane E. Norworsky.* 366, 270, 4-D1 (1991)

**A Study of the Ultraviolet Evolution of U Geminorum between Outbursts.** *Alan L. Kiplinger, Edward M. Sion, & Paula Szkody.* 366, 569, 10-B1 (1991)

**Optical and Radio Observations of the Binary Pulsar 1855+09: Evolution of Pulsar Magnetic Fields and Low-Mass White Dwarf Cooling.** *S. R. Kulkarni, S. Djorgovski, & A. R. Klemola.* 367, 221, 14-G4 (1991)

**Synthetic Spectra and Atmospheric Properties of Cool DA White Dwarfs.** *P. Bergeron, F. Wesemael, & G. Fontaine.* 367, 253, 15-C1 (1991)

**Ginga Observation of an AM Herculis Type Source H0538+608.** *M. Ishida, A. Silber, H. V. Bradt, R. A. Remillard, K. Makishima, & T. Ohashi.* 367, 270, 15-D6 (1991)

**Conditions for Accretion-induced Collapse of White Dwarfs.** *Ken'ichi Nomoto & Yoji Kondo.* 367, L19, 17-D1 (1991)

**Adiabatic Properties of Pulsating DA White Dwarfs. I. The Treatment of the Brunt-Väisälä Frequency and the Region of Period Formation.** *P. Brassard, G. Fontaine, F. Wesemael, S. D. Kawaler, & M. Tassoul.* 367, 601, 20-F11 (1991)

**Formulae for the Cyclotron Luminosity of Magnetized Plasma Slabs.** *G. Channugam & Steven H. Langer.* 368, 580, 32-C1 (1991)

**Asteroseismology of White Dwarf Stars. I. Adiabatic Results.** *P. A. Bradley & D. E. Winget.* 75, 463, 7-A13 (1991)

**Models of White Dwarfs under Rapid Uniform or Differential Rotation: Numerical Results. II.** *V. S. Gerojannis & A. A. Hadjopoulos.* 75, 499, 7-D11 (1991)

**A Spectrophotometric Atlas of White Dwarfs Compiled from the IUE Archives.** *Gary Wegner & Steven R. Swanson.* 75, 507, 7-E13 (1991)

**Thomson Scattering in a Magnetic Field. II. Arbitrary Field Orientation.** *Barbara A. Whitney.* 369, 451, 43-C10 (1991)

**Theoretical Light Curve for the Recurrent Nova RS Ophiuchi—Determination of the White Dwarf Mass, Composition, and Distance.** *Mariko Katao.* 369, 471, 43-E6 (1991)

**A Critical Analysis of the Ultraviolet Temperature Scale of the Helium-dominated DB and DBV White Dwarfs.** *Peter Thejll, Stéphane Vennes, & Harry L. Shipman.* 370, 355, 51-F5 (1991)

**Does Accretion Cease When a Star Approaches Breakup?** *Robert Popham & Ramesh Narayan.* 370, 604, 56-A6 (1991)

**Helium Star Cataclysms.** *Icko Iben, Jr., & Alexander V. Tutukov.* 370, 615, 56-B5 (1991)

**He Stars and He-accreting CO White Dwarfs.** *Marco Limongi & Amedeo Tornambè.* 371, 317, 64-A9 (1991)

**How Much Hydrogen Is There in a White Dwarf?** *James MacDonald & Stéphane Vennes.* 371, 719, 70-E1 (1991)

**Thomson Scattering in a Magnetic Field. I. Field along z.** *Barbara A. Whitney.* 75, 1293, 22-F1 (1991)

**White Dwarf and Neutron Star Interior Solutions in the Nonsymmetric Gravitational Theory.** *L. M. Campbell, J. W. Moffat, & P. Savaria.* 372, 241, 77-A1 (1991)

**Nuclear Reaction Rates in Dense Carbon-Oxygen Mixtures.** *Shuji Ogata, Hiroshi Iyetomi, & Setsuo Ichimaru.* 372, 259, 77-B9 (1991)

**The Isolated Massive DA White Dwarf GD 50.** *P. Bergeron, K. M. Kidder, J. B. Holberg, James Liebert, F. Wesemael, & Rex A. Saffer.* 372, 267, 77-C5 (1991)

- The Binary Feige 24: The Mass, Radius, and Gravitational Redshift of the DA White Dwarf. *Stéphane Vennes, John R. Thorstensen, Peter Thejll, & Harry L. Shipman.* 372, L37, 79-E5 (1991)
- Type Ia Supernovae: Constraints on Baryonic Dark Matter. *Tammy A. Smecker & Rosemary F. G. Wyse.* 372, 448, 81-D1 (1991)
- The Outcome of Explosive Ignition of ONeMg Cores: Supernovae, Neutron Stars, or "Iron" White Dwarfs? *Jordi Isern, Ramon Canal, & Javier Labay.* 372, L83, 85-D9 (1991)
- Single and Binary Star Evolution. *Icko Iben, Jr.* 76, 55, 24-G3 (1991)
- Accurate Collision Integrals for the Attractive Static Screened Coulomb Potential with Application to Electrical Conductivity. *James MacDonald.* 76, 369, 29-F3 (1991)
- Thermal X-Ray Emission from Classical Novae in Optical Decline. *James MacDonald & Stéphane Vennes.* 373, L51, 97-C4 (1991)
- Limits on the Space Density of Double Degenerates as Type Ia Supernova Progenitors. *Diana Foss, Richard A. Wade, & Richard F. Green.* 374, 281, 101-E9 (1991)
- The Pulse-timing and Emission-Line Orbits of the White Dwarf in the Cataclysmic Variable AE Aquarii. *Edward L. Robinson, Allen W. Shafter, & S. Balachandran.* 374, 298, 101-G1 (1991)
- The Infrared and Optical Pulsations of G29-38. *Joseph Patterson, B. Zuckerman, E. E. Becklin, D. J. Tholen, & T. Hawarden.* 374, 330, 102-C1 (1991)
- The Common Envelope Phase in Classical Novae: One-dimensional Models. *Anurag Shankar, Mario Livio, & James W. Truran.* 374, 623, 106-G6 (1991)
- Thermonuclear Reactions in Dense Stellar Matter: Electron Screening Revisited. *Seisuo Ichimaru & Shuji Ogata.* 374, 647, 107-B5 (1991)
- Inefficient Accretion by the DA2 White Dwarf in V471 Tauri. *D. J. Mullan, H. L. Shipman, E. M. Sion, & J. McDonald.* 374, 707, 107-G8 (1991)
- V1500 Cygni: A Prediction. *J. I. Katz.* 374, L59, 110-D11 (1991)
- Diffusion and Mixing in Classical Nova Precursors. *Icko Iben, Jr., Masayuki Y. Fujimoto, & Jim McDonald.* 375, L27, 117-D1 (1991)
- Noise-driven Radiative Shocks: A New Model for the Optical Quasi-periodic Oscillations of the AM Herculis Objects. *Michael T. Wolff, Kent S. Wood, & James N. Imamura.* 375, L31, 117-D6 (1991)
- The Formation and Detection of Strongly Magnetic White Dwarf Binaries in Globular Clusters. *G. Chanmugam, A. Ray, & K. P. Singh.* 375, 600, 120-B9 (1991)
- Gravitational Redshift Determinations for White Dwarfs in Common Proper-Motion Binaries. *Gary Wegner & I. Neill Reid.* 375, 674, 121-B1 (1991)
- The White Dwarf Mass Distribution in Classical Nova Systems. *Hans Ritter, Michael Politano, Mario Livio, & Ronald F. Webbink.* 376, 177, 127-B10 (1991)
- Gravitational Redshift for the Pleiad White Dwarf LB 1497. *Gary Wegner, I. Neill Reid, & Robert K. McMahan, Jr.* 376, 186, 127-C6 (1991)
- Equation of State in Metals and Cold Stars: Evaluation of Statistical Models. *Dong Lai, Andrew M. Abrahams, & Stuart L. Shapiro.* 377, 612, 147-C10 (1991)
- Asteroseismology of the DOV Star PG 1159-035 with the Whole Earth Telescope. *D. E. Winget, R. E. Nather, J. C. Clemens, J. Provencal, S. J. Kleinman, P. A. Bradley, M. A. Wood, C. F. Claver, M. L. Fruch, A. D. Grauer, B. P. Hine, C. J. Hansen, G. Fontaine, N. Achilleos, D. T. Wickramasinghe, T. M. K. Marar, S. Seetha, B. N. Ashoka, D. O'Donoghue, B. Warner, D. W. Kurtz, D. A. Buckley, J. Brickhill, G. Vauclair, N. Dolez, M. Chevreton, M. A. Barstow, J. E. Solheim, A. Kanaan, S. O. Kepler, G. W. Henry, & S. D. Kawaler.* 378, 326, 155-A10 (1991)
- The Optical Emission from Oscillating White Dwarf Radiative Shock Waves. *James N. Imamura, Hussain Rashed, & Michael T. Wolff.* 378, 665, 160-F5 (1991)
- Spin Evolution and Magnetic Fields in Cataclysmic Variables. *Andrew R. King & Jean-Pierre Lasota.* 378, 674, 160-G1 (1991)
- A Detection of the Evolutionary Time Scale of the DA White Dwarf G117-B15A with the Whole Earth Telescope. *S. O. Kepler, D. E. Winget, R. E. Nather, P. A. Bradley, A. D. Grauer, G. Fontaine, P. Bergeron, G. Vauclair, C. F. Claver, T. M. K. Marar, S. Seetha, B. N. Ashoka, T. Mazz, E. Leibowitz, N. Dolez, M. Chevreton, M. A. Barstow, J. C. Clemens, S. J. Kleinman, A. E. Sansom, R. W. Tweddle, A. Kanaan, B. P. Hine, J. L. Provencal, F. Wesemael, M. A. Wood.* 378, 685, 165-E5 (1991)
- P. Brassard, J.-E. Solheim, & P.-I. Emanuelson. 378, L45, 162-E7 (1991)
- Discovery and Seismological Interpretation of Low-Amplitude Modes in the Pulsating DO White Dwarf PG 1707+427 (V817 Herculis). *G. Fontaine, P. Bergeron, G. Vauclair, P. Brassard, F. Wesemael, S. D. Kawaler, A. D. Grauer, & D. E. Winget.* 378, L49, 162-F1 (1991)
- Spin-up of the White Dwarf in the Intermediate Polar 3A 0729+103. *Jyoti Singh, P. C. Agrawal, K. M. V. Apparao, P. Vivekananda Rao, & M. B. K. Sarma.* 380, 208, 178-E11 (1991)
- IUE Spectra of the Eclipsing Binary NN Serpentis. *Janet H. Wood & Thomas R. Marsh.* 381, 551, 197-E1 (1991)
- Existence of Scattering Atmospheres near Luminous, Magnetized Compact Objects. *Charles D. Dermer & Steven J. Turner.* 382, L23, 205-C11 (1991)
- Effects of Drag Luminosity in the Common Envelope Phase of Slow Novae. *Mariko Kato & Izumi Hatchisu.* 383, 761, 223-F3 (1991)
- Post-Asymptotic Giant Branch Nonradial Instability Strips. *Letizia Stanghellini, Arthur N. Cox, & Sumner Starrfield.* 383, 766, 223-F10 (1991)
- STARS: WINDS**
- Nonthermal X-Ray Emission from Winds of OB Supergiants. *Wan Chen & Richard L. White.* 366, 512, 9-D1 (1991)
- Infrared Spectroscopy of T Tauri Stars. *C. Giovanardi, S. Gennari, A. Natta, & R. Stanga.* 367, 173, 14-B1 (1991)
- NGC 6302: Ionized by a Very Hot Star or by a Wind? *N. J. Lane & G. J. Ferland.* 367, 208, 14-F1 (1991)
- On Winds and X-Rays of O-Type Stars. *Tomasz Chlebowski & Catharine D. Garmann.* 368, 241, 26-B1 (1991)
- Instabilities in Line-driven Stellar Winds. V. Effect of an Optically Thick Continuum. *S. P. Owocki & G. B. Rybicki.* 368, 261, 26-C11 (1991)
- Observation of a Pulsar Wind: CCD Polarimetry of the Crab Nebula. *F. C. Michel, P. A. Scowen, R. J. Dufour, & J. J. Hester.* 368, 463, 30-G1 (1991)
- The Effect of Viscosity on Steady Transonic Flow with a Nodal Solution Topology. *S. P. Owocki & G. P. Zank.* 368, 491, 31-C1 (1991)
- The Appearance of Highly Relativistic, Spherically Symmetric Stellar Winds. *Marek A. Abramowicz, Igor D. Novikov, & Bohdan Paczyński.* 369, 175, 38-B5 (1991)
- Continuum Polarization by Electron Scattering in Rotationally Distorted, Radiation-driven Stellar Winds: B[e] Supergiants. *Cameron J. Boyd & J. M. Marlborough.* 369, 191, 38-C11 (1991)
- Bow Shock Models of Ultracompact H II Regions. *Mordecai-Mark Mac Low, Dave Van Buren, Douglas O. S. Wood, & Ed Churchwell.* 369, 395, 42-F1 (1991)
- Evolution of the Chromospheres and Winds of Low- and Intermediate-Mass Giant Stars. *P. G. Judge & R. E. Stencel.* 371, 357, 64-E3 (1991)
- Enhanced Winds and Tidal Streams in Massive X-Ray Binaries. *John M. Blondin, Ian R. Stevens, & Timothy R. Kallman.* 371, 684, 70-B1 (1991)
- Accretion in Wind-driven X-Ray Sources. *Ronald E. Taam, Albert Fu, & B. A. Fryxell.* 371, 696, 70-C1 (1991)
- Observations of the Peculiar Object MWC 560 in Outburst. *A. G. Michalitsianos, S. P. Maran, R. J. Oliversen, B. Bopp, E. Kontizas, A. Dapergolas, & M. Kontizas.* 371, 761, 71-A7 (1991)
- Windswept Cometary Tail on the Galactic Center Supergiant IRS 7. *E. Yusof-Zadeh & Mark Morris.* 371, L59, 73-B10 (1991)
- Non-LTE Analysis of the Ospe/WN9 Star HDE 269227 (R84). *Werner Schmutz, Claus Leitherer, Ivan Hubeny, Manfred Vogel, Wolf-Rainer Hamann, & Ulf Wesselowsky.* 372, 664, 84-A1 (1991)
- Magnetic Confinement, Alfvén Wave Reflection, and the Origins of X-Ray and Mass-Loss "Dividing Lines" for Late-Type Giants and Supergiants. *R. Rosner, C.-H. An, Z. E. Musielak, R. L. Moore, & S. T. Suess.* 372, L91, 85-E5 (1991)
- The Formation of Molecules in Protostellar Winds. *A. E. Glassgold, G. A. Mamon, & P. J. Huggins.* 373, 254, 89-B7 (1991)
- V1500 Cygni: A Prediction. *J. I. Katz.* 374, L59, 110-D11 (1991)
- A Spectroscopic Search for Colliding Stellar Winds in O-Type Close Binary Systems. I. AO Cassiopeiae. *Douglas R. Gies & Michael S. Wiggs.* 375, 321, 114-G10 (1991)
- From Wind to Superwind: The Evolution of Mass-Loss Rates for Mira Models. *G. H. Bowen & L. A. Willson.* 375, L53, 124-C1 (1991)

- On Turbulent Diffusion of Magnetic Fields and the Loss of Magnetic Flux from Stars.** *Samuel I. Vainstein & Robert Rosner.* 376, 199, 127-D7 (1991)
- Rotational Evolution of Solar-Type Stars. I. Main-Sequence Evolution.** *K. B. MacGregor & M. Brenner.* 376, 204, 127-D13 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Spectroscopic Determination of Stellar Parameters of Melnick 42, an O3f Star in the Large Magellanic Cloud.** *S. R. Heap, B. Alten, D. Ebbets, I. Hubeny, J. B. Hutchings, R. P. Kudritzki, S. A. Voels, S. Haser, A. Pauldrach, J. Puls, & K. Butler.* 377, L29, 143-D6 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Evidence for Photospheric Microturbulence in Early O Stars: Are Surface Gravities Systematically Underestimated?** *I. Hubeny, S. R. Heap, & B. Alten.* 377, L33, 143-D11 (1991)
- Asymptotic Structure of Hydromagnetically Driven Relativistic Winds.** *Tzihong Chiueh, Zhi-yun Li, & Mitchell C. Begelman.* 377, 462, 145-D11 (1991)
- Observations of Stellar Winds from Hot Stars at 1.3 Millimeters.** *Claus Leitherer & Carmelle Robert.* 377, 629, 147-E1 (1991)
- Neutrino-heated Stars and Broad-Line Emission from Active Galactic Nuclei.** *James MacDonald, Todor Stanev, & Peter L. Biermann.* 378, 30, 151-D4 (1991)
- X-Ray-illuminated Stellar Winds: Optically Thick Wind Models for Massive X-Ray Binaries.** *Ian R. Stevens.* 379, 310, 167-A1 (1991)
- The Collimation of a Time-dependent Stellar Wind.** *S.-H. Kim & A. C. Raga.* 379, 689, 173-C4 (1991)
- Magnetically Driven Jets and Winds.** *R. V. E. Lovelace, H. L. Berk, & J. Contopoulos.* 379, 696, 173-D1 (1991)
- Wind Collision Effects in the Early-Type Close Binaries HD 47129 and AO Cassiopeiae.** *Jorge Sahade & Estela Brandt.* 379, 706, 173-E1 (1991)
- The Onset of Chromospheric Activity among the A and F Stars.** *Theodore Simon & Wayne Landsman.* 380, 200, 178-E3 (1991)
- Predicted Extreme-Ultraviolet Line Emission for Nearby Main-Sequence B Stars.** *J. J. MacFarlane, J. P. Cassinelli, B. Y. Welsh, P. W. Vedder, J. V. Vallerga, & W. L. Waldron.* 380, 564, 185-C1 (1991)
- Inverse-Compton Gamma-Ray Emission from Chaotic, Early-Type Stellar Winds and Its Detectability by *Gamma Ray Observatory*.** *Wan Chen & Richard L. White.* 381, L63, 199-E1 (1991)
- On the Wind Geometry of the Wolf-Rayet Star EZ Canis Majoris.** *R. E. Schulthe-Ladbeck, K. H. Nordsieck, M. Taylor, M. A. Nook, K. S. Bjorkman, A. M. Magalhães, & C. M. Anderson.* 382, 301, 204-A1 (1991)
- Direct Evidence for Stellar Wind X-Ray Absorption in O Stars.** *Wayne L. Waldron.* 382, 603, 209-A9 (1991)
- Time-dependent Radio Sources in the Star-forming Region Cepheus A (East).** *V.A. Hughes.* 383, 280, 215-F1 (1991)
- Infrared Recombination Lines of Hydrogen from Young Objects in the Southern Galactic Plane.** *Sara C. Beck, Jacqueline Fischer, & Howard A. Smith.* 383, 336, 216-D1 (1991)
- Two New Molecular Outflows in L1551?** *Marc W. Pound & John Bally.* 383, 705, 223-A7 (1991)
- STARS: WOLF-RAYET**
- Far-Infrared Observations and the Structure of Wolf-Rayet Ring Nebulae.** *A. P. Marston.* 366, 181, 3-C9 (1991)
- Instabilities in Line-driven Stellar Winds. V. Effect of an Optically Thick Continuum.** *S. P. Owocki & G. B. Rybicki.* 368, 261, 26-C11 (1991)
- Wolf-Rayet Stars as Starting Points or as Endpoints of the Evolution of Massive Stars?** *H. J. G. L. M. Lamers, A. Maeder, W. Schmutz, & J. P. Cassinelli.* 368, 538, 31-F12 (1991)
- HD 50896: Blobs in a Wind with a Collapsed Companion or Rotating Disk with Central Filaments?** *Anne B. Underhill & Stephenson Yang.* 368, 588, 32-D9 (1991)
- Non-LTE Analysis of the Ospre/WN9 Star HDE 269227 (R84).** *Werner Schmutz, Claus Leitherer, Ivan Hubeny, Manfred Vogel, Wolf-Rainer Hamann, & Ulf Wessolowski.* 372, 664, 84-A1 (1991)
- Ultraviolet Variability of the Massive W-R Binary System HDE 311884 = WR 47.** *Gloria Koenigsberger, Anthony F. J. Moffat, & Lawrence H. Auer.* 376, 272, 128-C9 (1991)
- Wolf-Rayet Galaxies: An Introduction and a Catalog.** *Peter S. Conti.* 377, 115, 139-D7 (1991)
- IRAS 17380-3031: A New Dusty Late WC-Type Wolf-Rayet Star.** *Martin Cohen, K. A. van der Hucht, P. M. Williams, & P. S. Thé.* 378, 302, 154-F7 (1991)
- On the Wind Geometry of the Wolf-Rayet Star EZ Canis Majoris.** *R. E. Schulthe-Ladbeck, K. H. Nordsieck, M. Taylor, M. A. Nook, K. S. Bjorkman, A. M. Magalhães, & C. M. Anderson.* 382, 301, 204-A1 (1991)
- About the Stage of Evolution of Wolf-Rayet Stars.** *Anne B. Underhill.* 383, 729, 223-C6 (1991)
- STARS: X-RAYS**
- Nonthermal X-Ray Emission from Winds of OB Supergiants.** *Wan Chen & Richard L. White.* 366, 512, 9-D1 (1991)
- On Winds and X-Rays of O-Type Stars.** *Tomasz Chlebowksi & Catharine D. Garmey.* 368, 241, 26-B1 (1991)
- Nonthermal Radio Emission from the X-Ray-Bright K5 IV Star 1E 1751+7046.** *Stephen L. Skinner.* 368, 272, 26-D11 (1991)
- Neutron Star Thermal Evolution.** *Kenneth A. Van Riper.* 75, 449, 6-G7 (1991)
- Steady State Energy Sources in Neutron Stars.** *Kenneth A. Van Riper.* 372, 251, 77-A13 (1991)
- On the X-Ray-emitting Boundary Layer of the Dwarf Nova VW Hydry.** *Christopher W. Mauche, Richard A. Wade, Ronald S. Polidan, Hans van der Woerd, & Fris B. S. Paerels.* 372, 659, 83-G7 (1991)
- Magnetic Confinement, Alfvén Wave Reflection, and the Origins of X-Ray and Mass-Loss "Dividing Lines" for Late-Type Giants and Supergiants.** *R. Rosner, C.-H. An, Z. E. Musielak, R. L. Moore, & S. T. Suess.* 372, L91, 85-E5 (1991)
- X-Ray Emission from Hybrid-Chromosphere Stars.** *Alexander Brown, Stephen A. Drake, Michael E. Van Steenberg, & Jeffrey L. Linsky.* 373, 614, 95-E9 (1991)
- Thermal X-Ray Emission from Classical Novae in Optical Decline.** *James MacDonald & Stéphane Venne.* 373, L51, 97-C4 (1991)
- The Einstein Observatory Extended Medium-Sensitivity Survey. II. The Optical Identifications.** *John T. Stocke, Simon L. Morris, I. M. Gioia, T. Maccacaro, R. Schild, A. Wolter, Thomas A. Fleming, & J. Patrick Henry.* 76, 813, 36-B1 (1991)
- Digging in the Coronal Graveyard: A ROSAT Observation of the Red Giant Arcturus.** *Thomas R. Ayres, Thomas A. Fleming, & Juergen H. M. M. Schmitt.* 376, L45, 137-C7 (1991)
- The EXOSAT High Galactic Latitude Survey.** *P. Giommi, G. Tagliaferri, K. Beuermann, G. Branduardi-Raymont, R. Brisenden, U. Gräser, K. O. Mason, J. D. P. Mittaz, P. Murdin, G. Pooley, H.-C. Thomas, & I. Tuohy.* 378, 77, 152-A5 (1991)
- The Unusual X-Ray Pulse Timing of AE Aquarii.** *O. C. De Jager.* 378, 286, 154-E1 (1991)
- Very High Energy Gamma-Ray Emission from Accreting X-Ray Pulsars.** *K. S. Cheng, K. N. Yu, T. Cheung, & M. M. Lau.* 379, 290, 166-F1 (1991)
- Discovery of Periodic Eclipses in the X-Ray Pulsar 1H 0253+193.** *Yuichi Kamata, Yuzuru Tawara, & Katsuji Koyama.* 379, L65, 175-C13 (1991)
- Numerical Simulations of Flares on M Dwarf Stars. I. Hydrodynamics and Coronal X-Ray Emission.** *Chung-Chieh Cheng & Roberto Pallavicini.* 381, 234, 191-G12 (1991)
- Soft X-Ray Pulses from Neutron Star Glitches.** *Kenneth A. Van Riper, Richard I. Epstein, & Guy S. Miller.* 381, L47, 199-C1 (1991)
- X-Ray Spectra of Cataclysmic Variables from the Einstein Observatory.** *Michael Eracleous, Jules Halpern, & Joseph Patterson.* 382, 290, 203-G1 (1991)
- Direct Evidence for Stellar Wind X-Ray Absorption in O Stars.** *Wayne L. Waldron.* 382, 603, 209-A9 (1991)
- The Coronal Dividing Line in the ROSAT X-Ray All-Sky Survey.** *Bernhard Haisch, J. H. M. M. Schmitt, & C. Rosso.* 383, L15, 219-C1 (1991)
- SUN: ABUNDANCES**
- The Response of the Adiabatic Exponent  $\Gamma_1$  to Modifications of Solar Models.** *J. Christensen-Dalsgaard & M. J. Thompson.* 367, 666, 21-E4 (1991)
- High Sensitivity of  $p$ -Modes near the Acoustic Cutoff Frequency to Solar Model Parameters.** *D. B. Guenther.* 369, 247, 39-A5 (1991)
- Solar Abundances from Gamma-Ray Spectroscopy: Comparisons with Energetic Particle, Photospheric, and Coronal Abundances.** *R. J.*

- Murphy, R. Ramaty, B. Kozlovsky, & D. V. Reames.** 371, 793, 71-D6 (1991)
- The Effects of Mass Flow on the Temperature and Abundance Structure of the Solar Transition Region.** *D. Tod Woods & Thomas E. Holzer.* 375, 800, 122-E7 (1991)
- Accurate Oscillator Strengths of Astrophysical Interest for Neutral Oxygen.** *E. Biémont, A. Hibbert, M. Godefroid, N. Vaeck, & B. C. Fawcett.* 375, 818, 122-G1 (1991)
- Our Sun. II. Early Mass Loss of  $0.1 M_{\odot}$  and the Case of the Missing Lithium.** *Arnold J. Boothroyd, I. Juliana Sackmann, & William A. Fowler.* 377, 318, 141-G11 (1991)
- The Depth of the Solar Convection Zone.** *J. Christensen-Dalsgaard, D. O. Gough, & M. J. Thompson.* 378, 413, 156-B4 (1991)
- The Iron-to-Calcium Abundance Ratio in the  $20 \times 10^6$  K Plasma of Medium and Large Solar Flares.** *K. J. H. Phillips & U. Feldman.* 379, 401, 168-A5 (1991)
- Gravitational Settling in Solar Models.** *Charles R. Proffitt & Georges Michaud.* 380, 238, 179-A5 (1991)
- Relative Abundances in the Lower Solar Transition Region.** *G. A. Doschek, K. P. Dere, & P. A. Lund.* 381, 583, 198-A1 (1991)
- On the Differences in Element Abundances of Energetic Ions from Corotating Events and from Large Solar Events.** *D. V. Reames, I. G. Richardson, & L. M. Barbier.* 382, L43, 205-E7 (1991)
- SUN: ACTIVITY**
- Solar Cycle Variation of the Interplanetary Magnetic Field Spiral.** *Charles W. Smith & John W. Bieber.* 370, 435, 52-F4 (1991)
- A Search for the 154 Day Periodicity in the Occurrence Rate of Solar Flares Using Ottawa 2.8 GHz Burst Data, 1955-1990.** *J. N. Kile & E. W. Cliver.* 370, 442, 52-F13 (1991)
- Solar Radio Microbursts at 1.4 GHz.** *T. S. Bastian.* 370, L49, 53-F11 (1991)
- Solar-Cycle Modulation of Event Rates in the Chlorine Solar Neutrino Experiment.** *John N. Bahcall & William H. Press.* 370, 730, 57-E1 (1991)
- The Magnetic Network Location of Explosive Events Observed in the Solar Transition Region.** *J. G. Porter & K. P. Dere.* 370, 775, 58-A11 (1991)
- Dynamic Magnetic Reconnection at an X-Type Neutral Point.** *J. J. D. Craig & A. N. McClymont.* 371, L41, 66-F1 (1991)
- Evidence for a 250 Second Brightness Oscillation at  $1600 \text{ \AA}$  in the Solar Temperature Minimum Region.** *J. W. Cook & J. A. Ewing.* 371, 804, 71-E5 (1991)
- Cosmic-Ray Diurnal Anisotropy, 1936-1988: Implications for Drift and Modulation Theories.** *John W. Bieber & Jiasheng Chen.* 372, 301, 77-F4 (1991)
- Line-blanketing Variations in the Irradiance Spectrum of the Sun from Maximum to Minimum of the Solar Cycle.** *W. E. Mitchell, Jr., & W. C. Livingston.* 372, 336, 78-B6 (1991)
- Solar Modulation of Cosmic Electrons: Evidence for Dynamic Regulation.** *Evelyn Tuska, Paul Evenson, & Peter Meyer.* 373, L27, 91-D1 (1991)
- Short-Term Changes in Solar Oscillation Frequencies and Solar Activity.** *M. F. Woodard, J. R. Kuhn, N. Murray, & K. G. Libbrecht.* 373, L81, 97-F12 (1991)
- Polar Faculae: 1906-1990.** *N. R. Sheeley, Jr.* 374, 386, 102-G11 (1991)
- The Stretching of Magnetic Flux Tubes in the Convective Overshoot Region.** *George H. Fisher, Alexander N. McClymont, & Dean-Yi Chou.* 374, 766, 108-E10 (1991)
- Is There an Acoustic Resonance in the Solar Chromosphere?** *M. F. Woodard & K. G. Libbrecht.* 374, L61, 110-E1 (1991)
- Magnetic Flux Transport and the Sun's Dipole Moment: New Twists to the Babcock-Leighton Model.** *Y.-M. Wang & N. R. Sheeley, Jr.* 375, 761, 122-B5 (1991)
- Avalanches and the Distribution of Solar Flares.** *Edward T. Lu & Russell J. Hamilton.* 380, L89, 188-F5 (1991)
- Nonfacular Solar Luminosity Variations.** *J. R. Kuhn & K. G. Libbrecht.* 381, L35, 194-E1 (1991)
- Signatures of Cosmic-Ray Interactions on the Solar Surface.** *D. Seckel, Todor Stanev, & T. K. Gaisser.* 382, 652, 209-F8 (1991)
- A New Solar Cycle Model Including Meridional Circulation.** *Y.-M. Wang, N. R. Sheeley, Jr., & A. G. Nash.* 383, 431, 217-F1 (1991)
- SUN: ATMOSPHERE**
- Magnetoatmospheric Oscillations in Sunspot Umbrae.** *S. S. Hasan.* 366, 328, 5-B7 (1991)
- High Sensitivity of *p*-Modes near the Acoustic Cutoff Frequency to Solar Model Parameters.** *D. B. Guenther.* 369, 247, 39-A5 (1991)
- Non-Maxwellian Electron Distributions in Models of the Solar Atmosphere.** *P. MacNeice, J. Fontenla, & N. N. Ljepojevic.* 369, 544, 44-E1 (1991)
- Wavelength Variation of *p*-Mode Intensity Fluctuations.** *R. S. Ronan, J. W. Harvey, & T. L. Duvall, Jr.* 369, 549, 44-E9 (1991)
- On the Thermal Stability of Slabs, Cylinders, and Spheres.** *Miguel H. Ibáñez S., & Florencio P. Plachco M.* 370, 743, 57-F1 (1991)
- High-Resolution Studies of the Structure of the Solar Atmosphere Using a New Imaging Algorithm.** *Margarita Karovska & Shadia Rifai Habbal.* 371, 402, 65-B1 (1991)
- Line-blanketing Variations in the Irradiance Spectrum of the Sun from Maximum to Minimum of the Solar Cycle.** *W. E. Mitchell, Jr., & W. C. Livingston.* 372, 336, 78-B6 (1991)
- Temperature-dependent Saturation of Hydrogen Lines in Solar Flares.** *K. G. Gayley.* 374, 773, 108-F5 (1991)
- Energy Balance in the Solar Transition Region. II. Effects of Pressure and Energy Input on Hydrostatic Models.** *J. M. Fontenla, E. H. Avrett, & R. Loeser.* 377, 712, 148-E1 (1991)
- Multicolor Continuum Analysis of the Solar Granulation in Quiet and Active Regions.** *C. U. Keller & S. Koutchmy.* 379, 751, 174-B1 (1991)
- Formation of the Infrared Emission Lines of Mg I in the Solar Atmosphere.** *E. S. Chang, E. H. Avrett, P. J. Mauas, R. W. Noyes, & R. Loeser.* 379, L79, 175-E1 (1991)
- Propagation of Magnetoacoustic Waves in the Solar Atmosphere with Random Inhomogeneities of Density and Magnetic Fields.** *M. Ryutova, M. Kaisig, & T. Tajima.* 380, 268, 179-D1 (1991)
- SUN: ATMOSPHERIC MOTIONS**
- The Magnetic Network Location of Explosive Events Observed in the Solar Transition Region.** *J. G. Porter & K. P. Dere.* 370, 775, 58-A11 (1991)
- The Source of Solar High-Frequency Acoustic Modes: Theoretical Expectations.** *Timothy M. Brown.* 371, 396, 65-A5 (1991)
- An Ultraviolet Spectral Atlas of a Sunspot and an Active Region 1190-1730 Å.** *P. Brekke, O. Kjeldseth-Moe, J.-D. F. Bartoe, & G. E. Brueckner.* 75, 1337, 23-C1 (1991)
- Power Spectra of Solar Convection.** *D.-Y. Chou, B. J. LaBonte, D. C. Braun, & T. L. Duvall, Jr.* 372, 314, 77-G5 (1991)
- Systematic Radial Flows in the Chromosphere, Transition Region, and Corona of the Quiet Sun.** *Donald M. Hassler, Gary J. Rottman, & Frank Q. Orrall.* 372, 710, 84-E1 (1991)
- Siphon Flows in Isolated Magnetic Flux Tubes. IV. Critical Flows with Standing Tube Shocks.** *John H. Thomas & Benjamin Montesinos.* 375, 404, 115-G11 (1991)
- Modeling Mesogranules and Exploders on the Solar Surface.** *G. W. Simon, A. M. Title, & N. O. Weiss.* 375, 775, 122-C7 (1991)
- The Effects of Mass Flow on the Temperature and Abundance Structure of the Solar Transition Region.** *D. Tod Woods & Thomas E. Holzer.* 375, 800, 122-E7 (1991)
- Motions, Fields, and Flares in the 1989 March Active Region.** *Haimin Wang, Frances Tang, Harold Zirin, & Guoxiang Ai.* 380, 282, 179-E1 (1991)
- Velocity Gradients in the Chromosphere-Corona Transition Region.** *R. Grant Athay & K. P. Dere.* 381, 323, 193-A6 (1991)
- SUN: CHROMOSPHERE**
- A Study of Solar Flare Energy Transport Based on Coordinated Hα and X-Ray Observations.** *Richard C. Canfield, Dominic M. Zarro, Jean-Pierre Wülser, & Brian R. Dennis.* 367, 671, 21-E11 (1991)
- Analysis of the Solar O II/O III Multiplets at 834 Å: Implications for the Emission Measure Distribution in the Vicinity of 40,000 K.** *R. R. Meier, K. G. Widing, & U. Feldman.* 369, 570, 44-G7 (1991)
- The Microwave Brightness Temperature Spectrum of the Quiet Sun.** *H. Zirin, B. M. Baumert, & G. J. Hurford.* 370, 779, 58-B12 (1991)
- The Sensitivity of Chromospherically Induced *p*- and *f*-Mode Frequency Shifts to the Height of the Magnetic Canopy.** *David J. Evans & B. Roberts.* 371, 387, 64-G9 (1991)

- Systematic Radial Flows in the Chromosphere, Transition Region, and Corona of the Quiet Sun.** Donald M. Hassler, Gary J. Rottman, & Frank Q. Orrall. 372, 710, 84-E1 (1991)
- Is There an Acoustic Resonance in the Solar Chromosphere?** M. F. Woodard & K. G. Libbrecht. 374, L61, 110-E1 (1991)
- Chromospheric and Transition Region Diagnostics Using Emission-Line Intensities.** R. Grant Athay & K. P. Dere. 379, 776, 174-D1 (1991)
- Inferring Chromospheric Flare Heating from Hydrogen-Line Wings.** K. G. Gayley & R. C. Canfield. 380, 660, 186-D1 (1991)
- Submillimeter Solar Limb Profiles Determined from Observations of the Total Solar Eclipse of 1988 March 18.** T. L. Roellig, E. E. Becklin, J. T. Jefferies, G. A. Kopp, C. A. Lindsey, F. Q. Orrall, & M. W. Werner. 381, 288, 192-E5 (1991)
- Magnetoacoustic Heating of the Solar Chromosphere.** Joseph M. Davila & S. M. Chitre. 381, L31, 194-D12 (1991)
- The Solar Chromospheric Supergranular Network in 850 Micron Radiation.** Charles A. Lindsey & John T. Jefferies. 383, 443, 217-G1 (1991)
- SUN: CORONA**
- Coronal Loop Heating by Wave-Particle Interactions.** Altair S. de Assis & King H. Thui. 366, 324, 5-B1 (1991)
- Strong Magnetic Fields and Inhomogeneity in the Solar Corona.** S. M. White, M. R. Kundu, & N. Gopalswamy. 366, L43, 6-E7 (1991)
- Three-dimensional Kinematic Reconnection of Plasmoids.** Yun-Tung Lau & John M. Finn. 366, 577, 10-B11 (1991)
- Rotation of the Sun's Outer White-Light Corona Determined from Solwind Data.** Ana G. Nash. 366, 592, 10-D1 (1991)
- A Study of Solar Flare Energy Transport Based on Coordinated H and X-Ray Observations.** Richard C. Canfield, Dominic M. Zarro, Jean-Pierre Wülser, & Brian R. Dennis. 367, 671, 21-E11 (1991)
- On the Transport and Acceleration of Solar Flare Particles in a Coronal Loop.** James M. Ryan & Martin A. Lee. 368, 316, 26-A7 (1991)
- First Interferometric Observations of Solar Microwave Millisecond Spike Bursts.** Dale E. Gary, G. J. Hurford, & D. J. Flees. 369, 255, 39-B1 (1991)
- Non-Maxwellian Electron Distributions in Models of the Solar Atmosphere.** P. MacNeice, J. Fontenla, & N. N. Ljepojevic. 369, 544, 44-E1 (1991)
- Opacity Effects on the Radiative Losses of Coronal Loops.** N. P. M. Kuin & A. I. Poland. 370, 763, 57-G11 (1991)
- The Microwave Brightness Temperature Spectrum of the Quiet Sun.** H. Zirin, B. M. Baumert, & G. J. Hurford. 370, 779, 58-B12 (1991)
- Dynamic Magnetic Reconnection at an X-Type Neutral Point.** I. J. D. Craig & A. N. McClymont. 371, L41, 66-F1 (1991)
- Current Sheet Formation and Rapid Reconnection in the Solar Corona.** A. Bhattacharjee & Xiangang Wang. 372, 321, 78-A1 (1991)
- Stability, Structure, and Evolution of Cool Loops.** P. S. Cally & T. D. Robb. 372, 329, 78-A11 (1991)
- Why Fast Solar Wind Originates from Slowly Expanding Coronal Flux Tubes.** Y.-M. Wang & N. R. Sheeley, Jr. 372, L45, 79-F1 (1991)
- Systematic Radial Flows in the Chromosphere, Transition Region, and Corona of the Quiet Sun.** Donald M. Hassler, Gary J. Rottman, & Frank Q. Orrall. 372, 710, 84-E1 (1991)
- Heating Solar Coronal Holes.** E. N. Parker. 372, 719, 84-E11 (1991)
- Coronal Proton Transport in the Presence of Alfvén Waves and Implications for Gamma-Ray Burst Models.** D. F. Smith & S. H. Brecher. 373, 289, 89-E9 (1991)
- A Catastrophe Mechanism for Coronal Mass Ejections.** T. G. Forbes & P. A. Isenberg. 373, 294, 89-F1 (1991)
- Coronal Magnetic Structures Observing Campaign. I. Simultaneous Microwave and Soft X-Ray Observations of Active Regions at the Solar Limb.** N. Nitta, S. M. White, M. R. Kundu, N. Gopalswamy, G. D. Holman, J. W. Brosius, J. T. Schmelz, J. L. R. Saba, & K. T. Strong. 374, 374, 102-F11 (1991)
- Coronal Dynamics of a Quiescent Active Region.** Julia L. R. Saba & Keith T. Strong. 375, 789, 122-D9 (1991)
- Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of Voyager 2.** T. P. Krisher, J. D. Anderson, D. D. Morabito, S. W. Asmar, S. E. Borozuk, M. L. Delitsky, A. C. Densmore, P. M. Eshe, G. D. Lewis, M. J. Maurer, D. C. Roth, Y. H. Son, T. R. Spilker, D. N. Sweetnam, A. H. Taylor, G. L. Tyler, D. L. Gresh, & P. A. Rosen. 375, L57, 124-C6 (1991)
- The Phase Mixing of Alfvén Waves, Coordinated Modes, and Coronal Heating.** E. N. Parker. 376, 355, 129-C11 (1991)
- First Observations of Macrospicules at 4.8 GHz at the Solar Limb in Polar Coronal Holes.** Shadia Rifai Habbal & Raymond D. Gonzalez. 376, L25, 130-D1 (1991)
- Numerical Study of Compressible Solar Magnetoconvection with an Open Transitional Boundary.** H. Hanami & T. Tajima. 377, 694, 148-C6 (1991)
- Alfvén Wave Trapping, Network Microflaring, and Heating in Solar Coronal Holes.** R. L. Moore, Z. E. Musielak, S. T. Suess, & C.-H. An. 378, 347, 155-C5 (1991)
- Multi-Wave Band SMM-VLA Observations of an M2 Flare and an Associated Coronal Mass Ejection.** Robert F. Willson, Joan T. Schmelz, Raymond D. Gonzalez, Kenneth R. Lang, & Kermit L. Smith. 378, 360, 155-D6 (1991)
- Coronal Mass Ejections and Streamers Associated with the New Cycle Active Regions at Solar Minimum.** S. Kahler. 378, 398, 155-G9 (1991)
- Can Neutron Stars Ablate Their Companions?** Amir Levinson & David Eichler. 379, 359, 167-E1 (1991)
- Large-Scale Features of the Sun at 20 Centimeter Wavelength.** N. Gopalswamy, S. M. White, & M. R. Kundu. 379, 366, 167-E9 (1991)
- The  $3s^23p\ ^2P - 3s3p\ ^4P$  Intercombination Lines of Fe XIV in the Sun.** F. P. Keenan, P. L. Dufton, E. S. Conlon, M. B. Boylan, A. E. Kingston, & K. G. Widner. 379, 406, 168-A11 (1991)
- On Solar Emission Lines.** G. P. Malik, L. K. Pande, & Vijaya S. Varma. 379, 788, 174-E1 (1991)
- Three-dimensional Compressible Hydrodynamic Convection in the Sun and Stars.** Mursheed Hossain & D. J. Mullan. 380, 631, 186-A10 (1991)
- Avalanches and the Distribution of Solar Flares.** Edward T. Lu & Russell J. Hamilton. 380, L39, 188-F5 (1991)
- On the Spontaneous Formation of Electric Current Sheets above a Flexible Solar Photosphere.** B. C. Low. 381, 295, 192-F1 (1991)
- Neutralized and Unneutralized Current Patterns in the Solar Corona.** D. B. Melrose. 381, 306, 192-F13 (1991)
- Numerical Simulations of Microflare Evolution in the Solar Transition Region and Corona.** Alphonse C. Sterling, John T. Mariska, Kazunari Shibata, & Yoshinori Suematsu. 381, 313, 192-G8 (1991)
- Coronal Current-Sheet Formation: The Effect of Asymmetric and Symmetric Shears.** Judith T. Karpen, Spiro K. Antiochos, & C. Richard DeVore. 382, 327, 204-C4 (1991)
- Nonequilibrium Ionization Effects in Asymmetrically Heated Loops.** D. Spadaro, S. K. Antiochos, & J. T. Mariska. 382, 338, 204-D1 (1991)
- On the Differences in Element Abundances of Energetic Ions from Corotating Events and from Large Solar Events.** D. V. Reames, I. G. Richardson, & L. M. Barbier. 382, L43, 205-E7 (1991)
- The Connection between Coronal Bright Points and the Variability of the Quiet-Sun Extreme-Ultraviolet Emission.** Shadia Rifai Habbal & Edmund Grace. 382, 667, 209-G11 (1991)
- Coronal Evolution Due to Shear Motion.** R. S. Steinolfson. 382, 677, 210-A13 (1991)
- Energy Balance in Coronal Funnels.** Douglas Rabin. 383, 407, 217-D1 (1991)
- Dynamics of Solar Coronal Magnetic Fields.** R. B. Dahlburg, S. K. Antiochos, & T. A. Zang. 383, 420, 217-E1 (1991)
- SUN: ECLIPSES**
- Formation of the Infrared Emission Lines of Mg I in the Solar Atmosphere.** E. S. Chang, E. H. Avrett, P. J. Mauas, R. W. Noyes, & R. Loeser. 379, L79, 175-E1 (1991)
- Submillimeter Solar Limb Profiles Determined from Observations of the Total Solar Eclipse of 1988 March 18.** T. L. Roellig, E. E. Becklin, J. T. Jefferies, G. A. Kopp, C. A. Lindsey, F. Q. Orrall, & M. W. Werner. 381, 288, 192-E5 (1991)

**SUN: FACULAE**

- On the Contrast of Facular Hillocks in the Infrared. *Kenneth H. Schatten & Hans G. Mayr.* 372, 728, 84-F7 (1991)
- Polar Faculae: 1906-1990. *N. R. Sheeley, Jr.* 374, 386, 102-G11 (1991)
- Weak Magnetic Fields and Solar Irradiance Variations. *J. K. Lawrence, G. A. Chapman & S. R. Walton.* 375, 771, 122-C1 (1991)
- Multicolor Continuum Analysis of the Solar Granulation in Quiet and Active Regions. *C. U. Keller & S. Koutchmy.* 379, 751, 174-B1 (1991)
- Nonfacular Solar Luminosity Variations. *J. R. Kuhn & K. G. Libbrecht.* 381, L35, 194-E1 (1991)

**SUN: FLARES**

- High Coronal Flares and Impulsive Acceleration of Solar Energetic Particles. *E. Cliver & S. Kahler.* 366, L91, 11-E11 (1991)
- A Study of Solar Flare Energy Transport Based on Coordinated H $\alpha$  and X-Ray Observations. *Richard C. Canfield, Dominic M. Zarro, Jean-Pierre Wülser, & Brian R. Dennis.* 367, 671, 21-E11 (1991)
- On the Transport and Acceleration of Solar Flare Particles in a Coronal Loop. *James M. Ryan & Martin A. Lee.* 368, 316, 26-A7 (1991)
- First Interferometric Observations of Solar Microwave Millisecond Spike Bursts. *Dale E. Gary, G. J. Hurford, & D. J. Flees.* 369, 255, 39-B1 (1991)
- Fe XII Line Ratios in Solar Flares. *S. S. Tayal, Ronald J. W. Henry, F. P. Keenan, S. M. McCann, & K. G. Widing.* 369, 567, 44-G1 (1991)
- Solar Radio Microbursts at 1.4 GHz. *T. S. Bastian.* 370, L49, 53-F11 (1991)
- Opacity Effects on the Radiative Losses of Coronal Loops. *N. P. M. Kuin & A. I. Poland.* 370, 763, 57-G11 (1991)
- The Magnetic Network Location of Explosive Events Observed in the Solar Transition Region. *J. G. Porter & K. P. Dere.* 370, 775, 58-A11 (1991)
- Dynamic Magnetic Reconnection at an X-Type Neutral Point. *I. J. D. Craig & A. N. McClymont.* 371, L41, 66-F1 (1991)
- Solar Abundances from Gamma-Ray Spectroscopy: Comparisons with Energetic Particle, Photospheric, and Coronal Abundances. *R. J. Murphy, R. Ramaty, B. Kozlovsky, & D. V. Reames.* 371, 793, 71-D6 (1991)
- Direct Radiation from a Strong DC Electric Field. *Donat G. Wentzel.* 373, 285, 89-E3 (1991)
- A Slingshot Model for Solar Flares. *Gregory Benford.* 373, 671, 96-C9 (1991)
- Fe XIV Line Ratios in the Sun. *F. P. Keenan, P. L. Dufton, M. B. Boylan, A. E. Kingston, & K. G. Widing.* 373, 695, 96-E13 (1991)
- Consequences of Strong Pitch-Angle Diffusion of Particles in Solar Flares. *P. A. Bespalov, V. V. Zaitsev, & A. V. Stepanov.* 374, 369, 102-F5 (1991)
- Temperature-dependent Saturation of Hydrogen Lines in Solar Flares. *K. G. Gayley.* 374, 773, 108-F5 (1991)
- Interrelation of Soft and Hard X-Ray Emissions during Solar Flares. I. Observations. *R. M. Winglee, A. L. Kiplinger, D. M. Zarro, G. A. Dulk, & J. R. Lemen.* 375, 366, 115-D13 (1991)
- Interrelation of Soft and Hard X-Ray Emissions during Solar Flares. II. Simulation Model. *R. M. Winglee, G. A. Dulk, P. L. Bornmann, & J. C. Brown.* 375, 382, 115-F1 (1991)
- How Much Energy Can Be Stored in a Three-dimensional Force-free Magnetic Field? *J. J. Aly.* 375, L61, 124-C11 (1991)
- Magnetohydrodynamic Turbulence Dissipation and Stochastic Proton Acceleration in Solar Flares. *James A. Miller.* 376, 342, 129-B11 (1991)
- The Interaction of Collisionless Shocks in Astrophysical Plasmas. *P. J. Cargill.* 376, 771, 136-A1 (1991)
- Particle Injection following Solar Flares on 1980 May 28 and June 8: Evidence for Different Injection Time Histories in Impulsive and Gradual Events? *M.-B. Kallenrode & G. Wibberenz.* 376, 787, 136-B8 (1991)
- Flares Observed by the Normal Incidence X-Ray Telescope on 1989 September 11. *M. Herant, F. Pardo, E. Spiller, & L. Golub.* 376, 797, 136-C6 (1991)
- Magnetohydrodynamics of an Impulsively Heated, Hard X-Ray Emitting Filament. *George Rousholtis & A. Gordon Emslie.* 377, 685, 148-B9 (1991)
- Alfvén Wave Trapping, Network Microflaring, and Heating in Solar Coronal Holes. *R. L. Moore, Z. E. Musielak, S. T. Suess, & C.-H. An.* 378, 347, 155-C5 (1991)
- Multi-Wave Band SMM-VLA Observations of an M2 Flare and an Associated Coronal Mass Ejection. *Robert F. Willson, Joan T. Schmelz, Raymond D. Gonzalez, Kenneth R. Lang, & Kermit L. Smith.* 378, 360, 155-D6 (1991)
- Center-to-Limb Variations of Characteristics of Solar Flare Hard X-Ray and Gamma-Ray Emission. *James M. McTiernan & Vahe Petrosian.* 379, 381, 167-F11 (1991)
- The Iron-to-Calcium Abundance Ratio in the  $20 \times 10^6$  K Plasma of Medium and Large Solar Flares. *K. J. H. Phillips & U. Feldman.* 379, 401, 168-A5 (1991)
- The  $3s^2 3p^2 P - 3s 3p^2 ^4P$  Intercombination Lines of Fe XIV in the Sun. *E. P. Keenan, P. L. Dufton, E. S. Conlon, M. B. Boylan, A. E. Kingston, & K. G. Widing.* 379, 406, 168-A11 (1991)
- Solar Gamma-Ray-Line Flares, Type II Radio Bursts, and Coronal Mass Ejections. *E. W. Cliver, H. V. Cane, D. J. Forrest, M. J. Koomen, R. A. Howard, & C. S. Wright.* 379, 741, 174-A2 (1991)
- Motions, Fields, and Flares in the 1989 March Active Region. *Haimin Wang, Frances Tang, Harold Zirin, & Guoxiang Ai.* 380, 282, 179-E1 (1991)
- Multispacecraft Observations of Solar  $^3\text{He}$ -rich Events. *D. V. Reames, M.-B. Kallenrode, & R. G. Stone.* 380, 287, 179-G1 (1991)
- Magnetic Field-aligned Electric Potentials in Nonideal Plasma Flows. *K. Schindler, M. Hesse, & J. Birn.* 380, 293, 179-G9 (1991)
- Avalanches and the Distribution of Solar Flares. *Edward T. Lu & Russell J. Hamilton.* 380, L89, 188-F5 (1991)
- Neutralized and Unneutralized Current Patterns in the Solar Corona. *D. B. Melrose.* 381, 306, 192-F13 (1991)
- Numerical Simulations of Microflare Evolution in the Solar Transition Region and Corona. *Alphonse C. Sterling, John T. Mariska, Kazunari Shibata, & Yoshinori Suematsu.* 381, 313, 192-G8 (1991)
- Soft X-Ray Emission from Electron-Beam-heated Solar Flares. *John T. Mariska & Dominic M. Zarro.* 381, 572, 197-F10 (1991)
- Subthreshold Stochastic Diffusion with Application to Selective Acceleration of  $^3\text{He}$  in Solar Flares. *Spilosios Riyopoulos.* 381, 578, 197-G5 (1991)
- Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector. *M. Aglietta, G. Badino, G. Bologna, C. Castagnoli, A. Castellina, V. L. Dadykin, W. Fulgione, P. Galeotti, F. F. Kalchukov, I. V. Korolkova, P. V. Kortchagin, V. A. Kudryavtsev, A. S. Malgin, L. Periale, V. G. Ryassny, O. G. Ryazhskaya, O. Saavedra, G. Trinchero, S. Vernetto, V. F. Yakushev, & G. T. Zatsepin.* 382, 344, 204-D9 (1991)
- Improved Line Ratio Calculations Involving  $\Delta n = 1$  (2-3) Transitions in O V and a Reanalysis of *Skylab* Observations of Solar Flares. *F. P. Keenan, P. L. Dufton, L. K. Harra, E. S. Conlon, K. A. Barrington, A. E. Kingston, & K. G. Widing.* 382, 349, 204-E1 (1991)
- Interplanetary Transport of Decay Protons from Solar Flare Neutrons. *D. Ruffolo.* 382, 688, 210-B12 (1991)
- SUN: GENERAL**
- Nonfacular Solar Luminosity Variations. *J. R. Kuhn & K. G. Libbrecht.* 381, L35, 194-E1 (1991)
- Do Changes in the Photospheric Magnetic Network Cause the 11 Year Variation of Total Solar Irradiance? *P. Foukal, K. Harvey, & F. Hill.* 383, L89, 226-G1 (1991)
- SUN: GRANULATION**
- Power Spectra of Solar Convection. *D.-Y. Chou, B. J. LaBonte, D. C. Braun, & T. L. Duvall, Jr.* 372, 314, 77-G5 (1991)
- Modeling Mesogranules and Exploders on the Solar Surface. *G. W. Simon, A. M. Title, & N. O. Weiss.* 375, 775, 122-C7 (1991)
- Multicolor Continuum Analysis of the Solar Granulation in Quiet and Active Regions. *C. U. Keller & S. Koutchmy.* 379, 751, 174-B1 (1991)
- Dynamical Buoyancy of Hydrodynamic Eddies. *E. N. Parker.* 380, 251, 179-B5 (1991)
- Compressible Magnetic Convection: Formulation and Two-dimensional Models. *Peter A. Fox, Michael L. Theobald, & Sabatino Sofia.* 383, 860, 225-A1 (1991)

**SUN: INTERIOR**

- Nonlinear Behavior of Solar Gravity Modes Driven by  $^3\text{He}$  in the Core. II. Numerical Simulations. *William J. Merryfield, Juri Toomre, & Douglas Gough.* 367, 658, 21-D8 (1991)
- The Response of the Adiabatic Exponent  $\Gamma_1$  to Modifications of Solar Models. *J. Christensen-Dalsgaard & M. J. Thompson.* 367, 666, 21-E4 (1991)
- Window for the Dark Matter Solution to the Solar Neutrino Problem. *David Dearborn, Kim Griest, & Georg Raffelt.* 368, 626, 33-A1 (1991)
- Opacities for the Solar Radiative Interior. *C. A. Iglesias & F. J. Rogers.* 371, 408, 65-C1 (1991)
- The Stretching of Magnetic Flux Tubes in the Convective Overshoot Region. *George H. Fisher, Alexander N. McClymont, & Dean-Yi Chou.* 374, 766, 108-E10 (1991)
- The  $p$ -Mode Oscillation Spectra of an Evolving  $1 M_\odot$  Sun-like Star. *D. B. Guenther.* 375, 352, 115-C8 (1991)
- Seismology for the Fine Structure in the Sun's Oscillations Varying with Its Activity Cycle. *W. A. Dziembowski & Philip R. Goode.* 376, 782, 136-B1 (1991)
- Our Sun. II. Early Mass Loss of  $0.1 M_\odot$  and the Case of the Missing Lithium. *Arnold I. Boothroyd, I. Juliana Sackmann, & William A. Fowler.* 377, 318, 141-G11 (1991)
- Does the Solar Interior Rotate Rigidly? *Andrew Gould.* 377, 707, 148-D7 (1991)
- Neutrino Oscillations and Solar Models. *C.-X. Chen & M. L. Cherry.* 377, L105, 150-F5 (1991)
- A Critical Look at Cosmions. *Jean Kaplan, François Martin de Volnay, Charling Tao, & Sylvaine Turck-Chieze.* 378, 315, 154-G11 (1991)
- Observational Constraints on Theories of the Solar Differential Rotation. *Bernard R. Durney.* 378, 378, 155-F1 (1991)
- The Effect of the Mihalas, Hummer, and Däppen Equation of State and the Molecular Opacity on the Standard Solar Model. *Y.-C. Kim, P. Demarque, & D. B. Guenther.* 378, 407, 156-A10 (1991)
- The Depth of the Solar Convection Zone. *J. Christensen-Dalsgaard, D. O. Gough, & M. J. Thompson.* 378, 413, 156-B4 (1991)
- Application of the Continuous Orthonormalization and Adjoint Methods to the Computation of Solar Eigenfrequencies and Eigenfrequency Sensitivities. *R. D. Rosenwald & G. F. Rabaey.* 77, 97, 44-G1 (1991)
- Gravitational Settling in Solar Models. *Charles R. Proffitt & Georges Michaud.* 380, 238, 179-A5 (1991)
- Effects of Opacity and Equation of State on Solar Structure and Oscillations. *Joyce A. Guzik & Arthur N. Cox.* 381, 333, 193-B5 (1991)
- Testing Einstein's Theory of Gravity by Analyzing Lunar Laser Ranging Data. *J. Müller, M. Schneider, M. Soffel, & H. Ruder.* 382, L101, 211-E12 (1991)
- A New Solar Cycle Model Including Meridional Circulation. *Y.-M. Wang, N. R. Sheeley, Jr., & A. G. Nash.* 383, 431, 217-F1 (1991)
- Compressible Magnetic Convection: Formulation and Two-dimensional Models. *Peter A. Fox, Michael L. Theobald, & Sabatino Sofia.* 383, 860, 225-A1 (1991)

**SUN: LIMB DARKENING**

- Telescope Beam-Profile Diagnostics and the Solar Limb. *Charles A. Lindsey & Thomas L. Roellig.* 375, 414, 116-A9 (1991)
- Submillimeter Solar Limb Profiles Determined from Observations of the Total Solar Eclipse of 1988 March 18. *T. L. Roellig, E. E. Becklin, J. T. Jefferies, G. A. Kopp, C. A. Lindsey, F. Q. Orrall, & M. W. Werner.* 381, 288, 192-E5 (1991)

**SUN: MAGNETIC FIELDS**

- Magnetoturbulence Oscillations in Sunspot Umbrae. *S. S. Hasan.* 366, 328, 5-B7 (1991)
- Strong Magnetic Fields and Inhomogeneity in the Solar Corona. *S. M. White, M. R. Kundu, & N. Gopalswamy.* 366, L43, 6-E7 (1991)
- Rotation of the Sun's Outer White-Light Corona Determined from Solwind Data. *Ana G. Nash.* 366, 592, 10-D1 (1991)
- Scattering of Acoustic Waves from a Magnetic Flux Tube Embedded in a Radiating Fluid. *T. J. Bogdan & M. Knölker.* 369, 219, 38-F1 (1991)
- Three-dimensional Structures of Magnetostatic Atmospheres. III. A General Formulation. *B. C. Low.* 370, 427, 52-E8 (1991)

The Magnetic Network Location of Explosive Events Observed in the Solar Transition Region. *J. G. Porter & K. P. Dere.* 370, 775, 58-A11 (1991)

The Sensitivity of Chromospherically Induced  $p$ - and  $f$ -Mode Frequency Shifts to the Height of the Magnetic Canopy. *David J. Evans & B. Roberts.* 371, 387, 64-G9 (1991)

The Resonant Absorption of  $p$ -Modes by Sunspots with Twisted Magnetic Fields. *S. M. Chitre & Joseph M. Davila.* 371, 785, 71-C10 (1991)

Why Fast Solar Wind Originates from Slowly Expanding Coronal Flux Tubes. *Y.-M. Wang & N. R. Sheeley, Jr.* 372, L45, 79-F1 (1991)

On the Inference of Magnetic Field Vectors from Stokes Profiles. *John T. Jefferies & Donald L. Mickey.* 372, 694, 84-C9 (1991)

Latitudinal Dynamics of Steady Solar Wind Flows. *W.-H. Yang & R. W. Schunk.* 372, 703, 84-D5 (1991)

Solar Modulation of Cosmic Electrons: Evidence for Dynamic Regulation. *Evelyn Tuska, Paul Evenson, & Peter Meyer.* 373, L27, 91-D1 (1991)

High-Resolution Spectra of Solar Magnetic Features. II. Magnetic Fields of Umbral Brightenings. *Bruce W. Lites, Thomas A. Bida, A. Johannesson, & G. B. Scharmer.* 373, 683, 96-D11 (1991)

Coronal Magnetic Structures Observing Campaign. I. Simultaneous Microwave and Soft X-Ray Observations of Active Regions at the Solar Limb. *N. Nitta, S. M. White, M. R. Kundu, N. Gopalswamy, G. D. Holman, J. W. Brosius, J. T. Schmelz, J. L. R. Saba, & K. T. Strong.* 374, 374, 102-F11 (1991)

Siphon Flows in Isolated Magnetic Flux Tubes. IV. Critical Flows with Standing Tube Shocks. *John H. Thomas & Benjamin Montesinos.* 375, 404, 115-G11 (1991)

Magnetic Flux Transport and the Sun's Dipole Moment: New Twists to the Babcock-Leighton Model. *Y.-M. Wang & N. R. Sheeley, Jr.* 375, 761, 122-B5 (1991)

Weak Magnetic Fields and Solar Irradiance Variations. *J. K. Lawrence, G. A. Chapman, & S. R. Walton.* 375, 771, 122-C1 (1991)

Modeling Mesogranules and Exploders on the Solar Surface. *G. W. Simon, A. M. Title, & N. O. Weiss.* 375, 775, 122-C7 (1991)

How Much Energy Can Be Stored in a Three-dimensional Force-free Magnetic Field? *J. J. Aly.* 375, L61, 124-C11 (1991)

Seismology for the Fine Structure in the Sun's Oscillations Varying with Its Activity Cycle. *W. A. Dziembowski & Philip R. Goode.* 376, 782, 136-B1 (1991)

Magnetohydrodynamics of an Impulsively Heated, Hard X-Ray Emitting Filament. *George Roumeliotis & A. Gordon Emslie.* 377, 685, 148-B9 (1991)

Large-Scale Features of the Sun at 20 Centimeter Wavelength. *N. Gopalswamy, S. M. White, & M. R. Kundu.* 379, 366, 167-E9 (1991)

Multicolor Continuum Analysis of the Solar Granulation in Quiet and Active Regions. *C. U. Keller & S. Koutchmy.* 379, 751, 174-B1 (1991)

Multiple Scattering of Acoustic Waves by a Pair of Uniformly Magnetized Flux Tubes. *Thomas J. Bogdan & David C. Fox.* 379, 758, 174-B10 (1991)

Chromospheric and Transition Region Diagnostics Using Emission-Line Intensities. *R. Grant Athay & K. P. Dere.* 379, 776, 174-D1 (1991)

Formation of the Infrared Emission Lines of Mg I in the Solar Atmosphere. *E. S. Chang, E. H. Avrett, P. J. Mauas, R. W. Noyes, & R. Loeser.* 379, L79, 175-E1 (1991)

Propagation of Magnetoacoustic Waves in the Solar Atmosphere with Random Inhomogeneities of Density and Magnetic Fields. *M. Ryutova, M. Kaisig, & T. Tajima.* 380, 268, 179-D1 (1991)

Motions, Fields, and Flares in the 1989 March Active Region. *Haimin Wang, Frances Tang, Harold Zirin, & Guoxiang Ai.* 380, 282, 179-E1 (1991)

Maximum Energy of Semi-infinite Magnetic Field Configurations. *P. A. Sturrock.* 380, 655, 186-C8 (1991)

Avalanches and the Distribution of Solar Flares. *Edward T. Lu & Russell J. Hamilton.* 380, L89, 188-F5 (1991)

On the Spontaneous Formation of Electric Current Sheets above a Flexible Solar Photosphere. *B. C. Low.* 381, 295, 192-F1 (1991)

Magnetoacoustic Heating of the Solar Chromosphere. *Joseph M. Davila & S. M. Chitre.* 381, L31, 194-D12 (1991)

- Vector Magnetic Fields in Sunspots. I. Stokes Profile Analysis Using the Marshall Space Flight Center Magnetograph.** *K. S. Balasubramaniam & E. A. West.* 382, 699, 210-C11 (1991)
- Energy Balance in Coronal Funnels.** *Douglas Rabin.* 383, 407, 217-D1 (1991)
- Dynamics of Solar Coronal Magnetic Fields.** *R. B. Dahlburg, S. K. Antiochos, & T. A. Zang.* 383, 420, 217-E1 (1991)
- A New Solar Cycle Model Including Meridional Circulation.** *Y.-M. Wang, N. R. Sheeley, Jr., & A. G. Nash.* 383, 431, 217-F1 (1991)
- Electric Field Strengths from the Solar 12 Micron Lines.** *Edward S. Chang & William G. Schoenfeld.* 383, 450, 217-G9 (1991)
- Do Changes in the Photospheric Magnetic Network Cause the 11 Year Variation of Total Solar Irradiance?** *P. Foukal, K. Harvey, & F. Hill.* 383, L89, 226-G1 (1991)
- SUN: OSCILLATIONS**
- Magnetoatmospheric Oscillations in Sunspot Umbras.** *S. S. Hasan.* 366, 328, 5-B7 (1991)
- On the Subadiabatic Magnetohydrodynamic Overstability in Background Polytropes.** *Yu-Qing Lou.* 367, 367, 16-E9 (1991)
- What We Know about the Sun's Internal Rotation from Solar Oscillations.** *Philip R. Goode, W. A. Dziembowski, S. G. Korzennik, & E. J. Rhodes, Jr.* 367, 649, 21-C11 (1991)
- Nonlinear Behavior of Solar Gravity Modes Driven by  $^3\text{He}$  in the Core. II. Numerical Simulations.** *William J. Merryfield, Juri Toomre, & Douglas Gough.* 367, 658, 21-D8 (1991)
- Scattering of Acoustic Waves from a Magnetic Flux Tube Embedded in a Radiating Fluid.** *T. J. Bogdan & M. Knölker.* 369, 219, 38-F1 (1991)
- Simulation of Effects of Atmospheric Seeing on the Observation of High-Degree Solar Oscillations.** *Frank Hill, Douglas Gough, William J. Merryfield, & Juri Toomre.* 369, 237, 38-G7 (1991)
- High Sensitivity of  $p$ -Modes near the Acoustic Cutoff Frequency to Solar Model Parameters.** *D. B. Guenther.* 369, 247, 39-A5 (1991)
- Wavelength Variation of  $p$ -Mode Intensity Fluctuations.** *R. S. Ronan, J. W. Harvey, & T. L. Duvall, Jr.* 369, 549, 44-E9 (1991)
- A Unified Approach to the Helioseismic Forward and Inverse Problems of Differential Rotation.** *Michael H. Ritzwoller & Eugene M. Lavelle.* 369, 557, 44-F5 (1991)
- Implications of Solar  $p$ -Mode Frequency Shifts.** *Peter Goldreich, Norman Murray, Gregory Willete, & Pawan Kumar.* 370, 752, 57-F12 (1991)
- The Sensitivity of Chromospherically Induced  $p$ - and  $f$ -Mode Frequency Shifts to the Height of the Magnetic Canopy.** *David J. Evans & B. Roberts.* 371, 387, 64-G9 (1991)
- The Source of Solar High-Frequency Acoustic Modes: Theoretical Expectations.** *Timothy M. Brown.* 371, 396, 65-A5 (1991)
- The Resonant Absorption of  $p$ -Modes by Sunspots with Twisted Magnetic Fields.** *S. M. Chitre & Joseph M. Davila.* 371, 785, 71-C10 (1991)
- Evidence for a 250 Second Brightness Oscillation at 1600 Å in the Solar Temperature Minimum Region.** *J. W. Cook & J. A. Ewing.* 371, 804, 71-E5 (1991)
- Measurements of High-Frequency Solar Oscillation Modes.** *T. L. Duvall, Jr., J. W. Harvey, S. M. Jefferies, & M. A. Pomerantz.* 373, 308, 89-G1 (1991)
- Short-Term Changes in Solar Oscillation Frequencies and Solar Activity.** *M. F. Woodard, J. R. Kuhn, N. Murray, & K. G. Libbrecht.* 373, L81, 97-F12 (1991)
- Thermal and Mechanical Damping of Solar  $p$ -Modes.** *Peter Goldreich & Pawan Kumar.* 374, 366, 102-F1 (1991)
- Is There an Acoustic Resonance in the Solar Chromosphere?** *M. F. Woodard & K. G. Libbrecht.* 374, L61, 110-E1 (1991)
- The  $p$ -Mode Oscillation Spectra of an Evolving 1  $M_\odot$  Sun-like Star.** *D. B. Guenther.* 375, 352, 115-C8 (1991)
- The Location of the Source of High-Frequency Solar Acoustic Oscillations.** *Pawan Kumar & Edward Lu.* 375, L35, 117-D12 (1991)
- Seismology for the Fine Structure in the Sun's Oscillations Varying with Its Activity Cycle.** *W. A. Dziembowski & Philip R. Goode.* 376, 782, 136-B1 (1991)
- Characteristics of Intermediate-Degree Solar  $p$ -Mode Line Widths.** *S. M. Jefferies, T. L. Duvall, Jr., J. W. Harvey, Y. Osaki, & M. A. Pomerantz.* 377, 330, 142-A11 (1991)
- Does the Solar Interior Rotate Rigidly?** *Andrew Gould.* 377, 707, 148-D7 (1991)
- The Effect of the Mihalas, Hummer, and Däppen Equation of State and the Molecular Opacity on the Standard Solar Model.** *Y.-C. Kim, P. Demarque, & D. B. Guenther.* 378, 407, 156-A10 (1991)
- The Depth of the Solar Convection Zone.** *J. Christensen-Dalsgaard, D. O. Gough, & M. J. Thompson.* 378, 413, 156-B4 (1991)
- Application of the Continuous Orthonormalization and Adjoint Methods to the Computation of Solar Eigenfrequencies and Eigenfrequency Sensitivities.** *R. D. Rosenwald & G. F. Rabey.* 77, 97, 44-G1 (1991)
- Multiple Scattering of Acoustic Waves by a Pair of Uniformly Magnetized Flux Tubes.** *Thomas J. Bogdan & David C. Fox.* 379, 758, 174-B10 (1991)
- Effects of Opacity and Equation of State on Solar Structure and Oscillations.** *Joyce A. Guzik & Arthur N. Cox.* 381, 333, 193-B5 (1991)
- SUN: PARTICLE EMISSION**
- High Coronal Flares and Impulsive Acceleration of Solar Energetic Particles.** *E. Cliver & S. Kahler.* 366, L91, 11-E11 (1991)
- Solar Abundances from Gamma-Ray Spectroscopy: Comparisons with Energetic Particle, Photospheric, and Coronal Abundances.** *R. J. Murphy, R. Ramaty, B. Kozlovsky, & D. V. Reames.* 371, 793, 71-D6 (1991)
- Coronal Proton Transport in the Presence of Alfvén Waves and Implications for Gamma-Ray Burst Models.** *D. F. Smith & S. H. Brecht.* 373, 289, 89-E9 (1991)
- A Catastrophe Mechanism for Coronal Mass Ejections.** *T. G. Forbes & P. A. Isenberg.* 373, 294, 89-F1 (1991)
- Solar Particle Abundances at Energies Greater than 1 MeV per Nucleon and the Role of Interplanetary Shocks.** *H. V. Cane, D. V. Reames, & T. L. von Rosenvinge.* 373, 675, 96-D1 (1991)
- Magnetohydrodynamic Turbulence Dissipation and Stochastic Proton Acceleration in Solar Flares.** *James A. Miller.* 376, 342, 129-B11 (1991)
- Particle Injection following Solar Flares on 1980 May 28 and June 8: Evidence for Different Injection Time Histories in Impulsive and Gradual Events?** *M.-B. Kallenrode & G. Wibberenz.* 376, 787, 136-B8 (1991)
- Coronal Mass Ejections and Streamers Associated with the New Cycle Active Regions at Solar Minimum.** *S. Kahler.* 378, 398, 155-G9 (1991)
- Solar Gamma-Ray-Line Flares, Type II Radio Bursts, and Coronal Mass Ejections.** *E. W. Cliver, H. V. Cane, D. J. Forrest, M. J. Koonen, R. A. Howard, & C. S. Wright.* 379, 741, 174-A2 (1991)
- Multispacecraft Observations of Solar  $^3\text{He}$ -rich Events.** *D. V. Reames, M.-B. Kallenrode, & R. G. Stone.* 380, 287, 179-G1 (1991)
- Maximum Energy of Semi-infinite Magnetic Field Configurations.** *P. A. Sturrock.* 380, 655, 186-C8 (1991)
- Statistical Properties of Shock-accelerated Ions in the Outer Heliosphere.** *L. J. Lanzerotti, R. E. Gold, D. J. Thomson, R. E. Decker, C. G. Maclennan, & S. M. Krimigis.* 380, L93, 188-F10 (1991)
- Parametric Study of the Formation of Magnetohydrodynamic Shocks. III. Fast and Slow Shocks.** *Y. C. Whang.* 381, 559, 197-E10 (1991)
- Large Solar Flares: Analysis of the Events Recorded by the Mont Blanc Neutrino Detector.** *M. Aglietta, G. Badino, G. Bologna, C. Castagnoli, A. Castellina, V. L. Dadykin, W. Fulgione, P. Galeotti, F. F. Kalchukov, I. V. Korolkova, P. V. Korchagin, V. A. Kudryavtsev, A. S. Malguin, L. Periale, V. G. Ryassny, O. G. Ryazhskaya, O. Saavedra, G. Trinchero, S. Vernetto, V. F. Yakushev, & G. T. Zatsepin.* 382, 344, 204-D9 (1991)
- Interplanetary Transport of Decay Protons from Solar Flare Neutrons.** *D. Ruffolo.* 382, 688, 210-B12 (1991)
- SUN: PLAGES**
- Weak Magnetic Fields and Solar Irradiance Variations.** *J. K. Lawrence, G. A. Chapman, & S. R. Walton.* 375, 771, 122-C1 (1991)
- Large-Scale Features of the Sun at 20 Centimeter Wavelength.** *N. Gopalswamy, S. M. White, & M. R. Kundu.* 379, 366, 167-E9 (1991)

Multicolor Continuum Analysis of the Solar Granulation in Quiet and Active Regions. *C. U. Keller & S. Koutchmy.* 379, 751, 174-B1 (1991)

#### SUN: PROMINENCES

A Twisted Flux-Tube Model for Solar Prominences. III. Magnetic Support. *C. Ridgway, E. R. Priest, & T. Amari.* 367, 321, 16-A10 (1991)

Opacity Effects on the Radiative Losses of Coronal Loops. *N. P. M. Kuin & A. J. Poland.* 370, 763, 57-G1 (1991)

Evolution to Nonequilibrium in Simple Models of Prominence Filaments. *Ellen G. Zweibel.* 376, 761, 135-G1 (1991)

A Model for the Formation of Solar Prominences. *S. K. Antiochos & J. A. Klimchuk.* 378, 372, 155-E6 (1991)

Prominence Sheets Supported by Constant-Current Force-free Fields. I. Imposition of Normal Magnetic Field Components at the Current Sheet and the Photosphere. *C. Ridgway, T. Amari, & E. R. Priest.* 378, 773, 162-A1 (1991)

Large-Scale Features of the Sun at 20 Centimeter Wavelength. *N. Gopalswamy, S. M. White, & M. R. Kundu.* 379, 366, 167-E9 (1991)

#### SUN: RADIO RADIATION

Strong Magnetic Fields and Inhomogeneity in the Solar Corona. *S. M. White, M. R. Kundu, & N. Gopalswamy.* 366, L43, 6-E7 (1991)

First Interferometric Observations of Solar Microwave Millisecond Spike Bursts. *Dale E. Gary, G. J. Hurford, & D. J. Flees.* 369, 255, 39-B1 (1991)

A Search for the 154 Day Periodicity in the Occurrence Rate of Solar Flares Using Ottawa 2.8 GHz Burst Data, 1955–1990. *J. N. Kile & E. W. Cliver.* 370, 442, 52-F13 (1991)

Solar Radio Microbursts at 1.4 GHz. *T. S. Bastian.* 370, L49, 53-F11 (1991)

The Microwave Brightness Temperature Spectrum of the Quiet Sun. *H. Zirin, B. M. Baumert, & G. J. Hurford.* 370, 779, 58-B12 (1991)

Solar and Stellar Radio Spikes: Limits on the Saturation of the Electron-Cyclotron Maser. *Donat G. Wentzel & Markus J. Aschwanden.* 372, 688, 84-C1 (1991)

Direct Radiation from a Strong DC Electric Field. *Donat G. Wentzel.* 373, 285, 89-E3 (1991)

Coronal Magnetic Structures Observing Campaign. I. Simultaneous Microwave and Soft X-Ray Observations of Active Regions at the Solar Limb. *N. Nitta, S. M. White, M. R. Kundu, N. Gopalswamy, G. D. Holman, J. W. Brosius, J. T. Schmelz, J. L. R. Saba, & K. T. Strong.* 374, 374, 102-F11 (1991)

Telescope Beam-Profil Diagnostics and the Solar Limb. *Charles A. Lindsey & Thomas L. Roellig.* 375, 414, 116-A9 (1991)

First Observations of Macroscopicules at 4.8 GHz at the Solar Limb in Polar Coronal Holes. *Shadia Rifai Habbal & Raymond D. Gonzalez.* 376, L25, 130-D1 (1991)

Multi-Wave Band SMM-VLA Observations of an M2 Flare and an Associated Coronal Mass Ejection. *Robert F. Willson, Joan T. Schmelz, Raymond D. Gonzalez, Kenneth R. Lang, & Kermit L. Smith.* 378, 360, 155-D6 (1991)

Large-Scale Features of the Sun at 20 Centimeter Wavelength. *N. Gopalswamy, S. M. White, & M. R. Kundu.* 379, 366, 167-E9 (1991)

Solar Gamma-Ray-Line Flares, Type II Radio Bursts, and Coronal Mass Ejections. *E. W. Cliver, H. V. Cane, D. J. Forrest, M. J. Koomen, R. A. Howard, & C. S. Wright.* 379, 741, 174-A2 (1991)

Emission at Cyclotron Harmonics Due to Coalescence of z-Mode Waves. *D. B. Melrose.* 380, 256, 179-C1 (1991)

Multispacecraft Observations of Solar  $^3\text{He}$ -rich Events. *D. V. Reames, M.-B. Kallenrode, & R. G. Stone.* 380, 287, 179-G1 (1991)

The Solar Chromospheric Supergranular Network in 850 Micron Radiation. *Charles A. Lindsey & John T. Jefferies.* 383, 443, 217-G1 (1991)

#### SUN: ROTATION

Rotation of the Sun's Outer White-Light Corona Determined from Solwind Data. *Ana G. Nash.* 366, 592, 10-D1 (1991)

What We Know about the Sun's Internal Rotation from Solar Oscillations. *Philip R. Goode, W. A. Dziembowski, S. G. Korzennik, & E. J. Rhodes, Jr.* 367, 649, 21-C11 (1991)

A Unified Approach to the Helioseismic Forward and Inverse Problems of Differential Rotation. *Michael H. Ritzwoller & Eugene M. Lavely.* 369, 557, 44-F5 (1991)

Magnetic Flux Transport and the Sun's Dipole Moment: New Twists to the Babcock-Leighton Model. *Y.-M. Wang & N. R. Sheeley, Jr.* 375, 761, 122-B5 (1991)

Does the Solar Interior Rotate Rigidly? *Andrew Gould.* 377, 707, 148-D7 (1991)

Observational Constraints on Theories of the Solar Differential Rotation. *Bernard R. Durney.* 378, 155-F1 (1991)

A New Solar Cycle Model Including Meridional Circulation. *Y.-M. Wang, N. R. Sheeley, Jr., & A. G. Nash.* 383, 431, 217-F1 (1991)

A Torsional Oscillation in the Rotation of the Solar Magnetic Field. *Herschel B. Snodgrass.* 383, L85, 226-F10 (1991)

#### SUN: SOLAR WIND

Densities and Abundances of Hot Cometary Ions in the Coma of P/Halley. *M. Neugebauer, R. Goldstein, B. E. Goldstein, S. A. Fuselier, H. Balsiger, & W.-H. Ip.* 372, 291, 77-E6 (1991)

Why Fast Solar Wind Originates from Slowly Expanding Coronal Flux Tubes. *Y.-M. Wang & N. R. Sheeley, Jr.* 372, L45, 79-F1 (1991)

Latitudinal Dynamics of Steady Solar Wind Flows. *W.-H. Yang & R. W. Schunk.* 372, 703, 84-D5 (1991)

Heating Solar Coronal Holes. *E. N. Parker.* 372, 719, 84-E11 (1991)

The Influence of the Interface between the Heliosphere and the Local Interstellar Medium on the Penetration of the H Atoms to the Solar System. *V. B. Baranov, M. G. Lebedev, & Yu. G. Malama.* 375, 347, 115-C1 (1991)

Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1988 Solar Conjunction of Voyager 2. *T. P. Krisher, J. D. Anderson, D. D. Morabito, S. W. Asmar, S. E. Borutzki, M. L. Delitsky, A. C. Densmore, P. M. Eshe, G. D. Lewis, M. J. Maurer, D. C. Roth, Y. H. Son, T. R. Spilker, D. N. Sweetnam, A. H. Taylor, G. L. Tyler, D. L. Gresh, & P. A. Rosen.* 375, L57, 124-C6 (1991)

The Phase Mixing of Alfvén Waves, Coordinated Modes, and Coronal Heating. *E. N. Parker.* 376, 355, 129-C11 (1991)

The Interaction of Collisionless Shocks in Astrophysical Plasmas. *P. J. Cargill.* 376, 771, 136-A1 (1991)

Can Neutron Stars Ablate Their Companions? *Amir Levinson & David Eichler.* 379, 359, 167-E1 (1991)

Observations of Solar Wind Ion Charge Exchange in the Comet Halley Coma. *S. A. Fuselier, E. G. Shelley, B. E. Goldstein, R. Goldstein, M. Neugebauer, W.-H. Ip, H. Balsiger, & H. Rème.* 379, 734, 173-G8 (1991)

Parametric Study of the Formation of Magnetohydrodynamic Shocks. III. Fast and Slow Shocks. *Y. C. Whang.* 381, 559, 197-E10 (1991)

On the Differences in Element Abundances of Energetic Ions from Corotating Events and from Large Solar Events. *D. V. Reames, I. G. Richardson, & L. M. Barbier.* 382, L43, 205-E7 (1991)

#### SUN: SPECTRA

Fe XII Line Ratios in Solar Flares. *S. S. Tayal, Ronald J. W. Henry, F. P. Keenan, S. M. McCann, & K. G. Widing.* 369, 567, 44-G1 (1991)

Analysis of the Solar O II/O III Multiplets at 834 Å: Implications for the Emission Measure Distribution in the Vicinity of 40,000 K. *R. R. Meier, K. G. Widing, & U. Feldman.* 369, 570, 44-G7 (1991)

The Solar Spectrum between 914 and 1177 Å. *U. Feldman & G. A. Doschek.* 75, 925, 14-B13 (1991)

High-Resolution Studies of the Structure of the Solar Atmosphere Using a New Imaging Algorithm. *Margarita Karovska & Shadia Rifai Habbal.* 371, 402, 65-B1 (1991)

An Ultraviolet Spectral Atlas of a Sunspot and an Active Region 1190–1730 Å. *P. Brekke, O. Kjeldseth-Moe, J.-D. F. Bartoe, & G. E. Brueckner.* 75, 1337, 23-C1 (1991)

Line-blanketing Variations in the Irradiance Spectrum of the Sun from Maximum to Minimum of the Solar Cycle. *W. E. Mitchell, Jr., & W. C. Livingston.* 372, 336, 78-B6 (1991)

On the Inference of Magnetic Field Vectors from Stokes Profiles. *John T. Jefferies & Donald L. Mickey.* 372, 694, 84-C9 (1991)

Fe XIV Line Ratios in the Sun. *F. P. Keenan, P. L. Dufton, M. B. Boylan, A. E. Kingston, & K. G. Widing.* 373, 695, 96-E13 (1991)

- Solar Gravitational Redshift from the Infrared Oxygen Triplet. *James C. LoPresto, Charles Schrader, & A. Keith Pierce.* 376, 757, 135-F11 (1991)
- Characteristics of Intermediate-Degree Solar *p*-Mode Line Widths. *S. M. Jefferies, T. L. Duvall, Jr., J. W. Harvey, Y. Osaki, & M. A. Pomerantz.* 377, 330, 142-A11 (1991)
- The Solar Mg I Spectrum from ATMOS. I. Identification and Preliminary Discussion. *John T. Jefferies.* 377, 337, 142-B5 (1991)
- The O VII Soft X-Ray Spectrum and Its Application to Hot Plasmas in Astrophysics. *A. H. Gabriel, F. Bely-Dubau, P. Faucher, & L. W. Acton.* 378, 438, 156-D1 (1991)
- The  $3s^2 3p \rightarrow 3s 3p^2$   $4P$  Intercombination Lines of Fe XIV in the Sun. *F. P. Keenan, P. L. Dufson, E. S. Conlon, M. B. Boylan, A. E. Kingston, & K. G. Widing.* 379, 406, 168-A11 (1991)
- Chromospheric and Transition Region Diagnostics Using Emission-Line Intensities. *R. Grant Athay & K. P. Dere.* 379, 776, 174-D1 (1991)
- On Solar Emission Lines. *G. P. Malik, L. K. Pande, & Vijaya S. Varma.* 379, 788, 174-E1 (1991)
- Velocity Gradients in the Chromosphere-Corona Transition Region. *R. Grant Athay & K. P. Dere.* 381, 323, 193-A6 (1991)
- Improved Line Ratio Calculations Involving  $\Delta n = 1$  (2-3) Transitions in O V and Reanalysis of *Skylab* Observations of Solar Flares. *F. P. Keenan, P. L. Dufson, L. K. Hara, E. S. Conlon, K. A. Berrington, A. E. Kingston, & K. G. Widing.* 382, 349, 204-E1 (1991)
- Electric Field Strengths from the Solar 12 Micron Lines. *Edward S. Chang & William G. Schoenfeld.* 383, 450, 217-G9 (1991)
- SUN: SUNSPOTS**
- Strong Magnetic Fields and Inhomogeneity in the Solar Corona. *S. M. White, M. R. Kundu, & N. Gopalswamy.* 366, L43, 6-E7 (1991)
- On the Subadiabatic Magnetohydrodynamic Overstability in Background Polytropes. *Yu-Qing Lou.* 367, 367, 16-E9 (1991)
- Can the Starpatch on  $\xi$  Bootis A Be Explained by Using Tangential Flows? *Clifford G. Toner & Barry J. LaBonte.* 368, 633, 33-A10 (1991)
- Scattering of Acoustic Waves from a Magnetic Flux Tube Embedded in a Radiating Fluid. *T. J. Bogdan & M. Knölker.* 369, 219, 38-F1 (1991)
- The Resonant Absorption of *p*-Modes by Sunspots with Twisted Magnetic Fields. *S. M. Chitre & Joseph M. Davila.* 371, 785, 71-C10 (1991)
- An Ultraviolet Spectral Atlas of a Sunspot and an Active Region 1190–1730 Å. *P. Brekke, O. Kjeldseth-Moe, J.-D. F. Bartoe, & G. E. Brueckner.* 75, 1337, 23-C1 (1991)
- High-Resolution Spectra of Solar Magnetic Features. II. Magnetic Fields of Umbral Brightenings. *Bruce W. Lites, Thomas A. Bida, A. Johannesson, & G. B. Scharmer.* 373, 683, 96-D11 (1991)
- Siphon Flows in Isolated Magnetic Flux Tubes. IV. Critical Flows with Standing Tube Shocks. *John H. Thomas & Benjamin Montesinos.* 375, 404, 115-G11 (1991)
- Linear and Circular Digital Spectral Analysis of Serial Data. *Richard B. Stothers.* 375, 423, 116-B6 (1991)
- Large-Scale Features of the Sun at 20 Centimeter Wavelength. *N. Gopalswamy, S. M. White, & M. R. Kundu.* 379, 366, 167-E9 (1991)
- Multiple Scattering of Acoustic Waves by a Pair of Uniformly Magnetized Flux Tubes. *Thomas J. Bogdan & David C. Fox.* 379, 758, 174-B10 (1991)
- Relative Abundances in the Lower Solar Transition Region. *G. A. Doschek, K. P. Dere, & P. A. Lund.* 381, 583, 198-A1 (1991)
- Vector Magnetic Fields in Sunspots. I. Stokes Profile Analysis Using the Marshall Space Flight Center Magnetograph. *K. S. Balasubramanian & E. A. West.* 382, 699, 210-C11 (1991)
- SUN: TRANSITION REGION**
- Non-Maxwellian Electron Distributions in Models of the Solar Atmosphere. *P. MacNeice, J. Fontenla, & N. N. Ljepojevic.* 369, 544, 44-E1 (1991)
- The Magnetic Network Location of Explosive Events Observed in the Solar Transition Region. *J. G. Porter & K. P. Dere.* 370, 775, 58-A11 (1991)
- The Microwave Brightness Temperature Spectrum of the Quiet Sun. *H. Zirin, B. M. Baumert, & G. J. Hurford.* 370, 779, 58-B12 (1991)
- Stability, Structure, and Evolution of Cool Loops. *P. S. Cally & T. D. Robb.* 372, 329, 78-A11 (1991)
- Systematic Radial Flows in the Chromosphere, Transition Region, and Corona of the Quiet Sun. *Donald M. Hassler, Gary J. Rottman, & Frank Q. Orrall.* 372, 710, 84-E1 (1991)
- The Effects of Mass Flow on the Temperature and Abundance Structure of the Solar Transition Region. *D. Tod Woods & Thomas E. Holzer.* 375, 800, 122-E7 (1991)
- Energy Balance in the Solar Transition Region. II. Effects of Pressure and Energy Input on Hydrostatic Models. *J. M. Fontenla, E. H. Avrett, & R. Loeser.* 377, 712, 148-E1 (1991)
- Joule Heating as an Explanation for the Differential Emission Measure Structure and Systematic Redshifts in the Sun's Lower Transition Region. *George Roumeliotis.* 379, 392, 167-G9 (1991)
- Chromospheric and Transition Region Diagnostics Using Emission-Line Intensities. *R. Grant Athay & K. P. Dere.* 379, 776, 174-D1 (1991)
- Numerical Simulations of Microflare Evolution in the Solar Transition Region and Corona. *Alphonse C. Sterling, John T. Mariska, Kazunari Shibata, & Yoshihori Suematsu.* 381, 313, 192-G8 (1991)
- Velocity Gradients in the Chromosphere-Corona Transition Region. *R. Grant Athay & K. P. Dere.* 381, 323, 193-A6 (1991)
- Relative Abundances in the Lower Solar Transition Region. *G. A. Doschek, K. P. Dere, & P. A. Lund.* 381, 583, 198-A1 (1991)
- Nonequilibrium Ionization Effects in Asymmetrically Heated Loops. *D. Spadaro, S. K. Antiochos, & J. T. Mariska.* 382, 338, 204-D1 (1991)
- Energy Balance in Coronal Funnels. *Douglas Rabin.* 383, 407, 217-D1 (1991)
- SUN: X-RAYS**
- A Study of Solar Flare Energy Transport Based on Coordinated Hα and X-Ray Observations. *Richard C. Canfield, Dominic M. Zarro, Jean-Pierre Wülser, & Brian R. Dennis.* 367, 671, 21-E11 (1991)
- On the Transport and Acceleration of Solar Flare Particles in a Coronal Loop. *James M. Ryan & Martin A. Lee.* 368, 316, 26-A7 (1991)
- Solar Radio Microbursts at 1.4 GHz. *T. S. Bastian.* 370, L49, 53-F11 (1991)
- A Slingshot Model for Solar Flares. *Gregory Benford.* 373, 671, 96-C9 (1991)
- Consequences of Strong Pitch-Angle Diffusion of Particles in Solar Flares. *P. A. Bespalov, V. V. Zaitsev, & A. V. Stepanov.* 374, 369, 102-F5 (1991)
- Coronal Magnetic Structures Observing Campaign. I. Simultaneous Microwave and Soft X-Ray Observations of Active Regions at the Solar Limb. *N. Nitta, S. M. White, M. R. Kundu, N. Gopalswamy, G. D. Holman, J. W. Brosius, J. T. Schmelz, J. L. R. Saba, & K. T. Strong.* 374, 374, 102-F11 (1991)
- Interrelation of Soft and Hard X-Ray Emissions during Solar Flares. I. Observations. *R. M. Winglee, A. L. Kiplinger, D. M. Zarro, G. A. Dulk, & J. R. Lemen.* 375, 366, 115-D13 (1991)
- Interrelation of Soft and Hard X-Ray Emissions during Solar Flares. II. Simulation Model. *R. M. Winglee, G. A. Dulk, P. L. Bornmann, & J. C. Brown.* 375, 382, 115-F1 (1991)
- Coronal Dynamics of a Quiescent Active Region. *Julia L. R. Saba & K. T. Strong.* 375, 789, 122-D9 (1991)
- Flares Observed by the Normal Incidence X-Ray Telescope on 1989 September 11. *M. Herant, F. Pardo, E. Spiller, & L. Golub.* 376, 797, 136-C6 (1991)
- Magnetohydrodynamics of an Impulsively Heated, Hard X-Ray Emitting Filament. *George Roumeliotis & A. Gordon Emslie.* 377, 685, 148-B9 (1991)
- Multi-Wave Band SMM-VLA Observations of an M2 Flare and an Associated Coronal Mass Ejection. *Robert F. Willson, Joan T. Schmelz, Raymond D. Gonzalez, Kenneth R. Lang, & Kermit L. Smith.* 378, 360, 155-D6 (1991)
- Center-to-Limb Variations of Characteristics of Solar Flare Hard X-Ray and Gamma-Ray Emission. *James M. McTiernan & Vahé Petrosian.* 379, 381, 167-F11 (1991)
- The Iron-to-Calcium Abundance Ratio in the  $20 \times 10^6$  K Plasma of Medium and Large Solar Flares. *K. J. H. Phillips & U. Feldman.* 379, 401, 168-A5 (1991)

- Avalanches and the Distribution of Solar Flares. *Edward T. Lu & Russell J. Hamilton.* 380, L89, 188-F5 (1991)
- Soft X-Ray Emission from Electron-Beam-heated Solar Flares. *John T. Mariska & Dominic M. Zarro.* 381, 572, 197-F10 (1991)
- ### TRANSITION PROBABILITIES
- Dielectronic Recombination Rate Coefficients for  $S^{q+}$  ( $q = 1-5$ ) Ions. *N. R. Badnell.* 379, 356, 167-D9 (1991)
- Atomic Data for Resonance Absorption Lines. I. Wavelengths Longward of the Lyman Limit. *Donald C. Morton.* 77, 119, 45-B1 (1991)
- Collisional Rates and Cooling within Atomic Hydrogen Plasmas. *T. T. Scholz & H. R. J. Walters.* 380, 302, 180-A5 (1991)
- A Table of Astronomically Important Ro-vibrational Transitions for the  $H_3^+$  Molecular Ion. *Lancelot Kao, Takeshi Oka, Steven Miller, & Jonathan Tennyson.* 77, 317, 48-E1 (1991)
- Collision Strengths and Excitation Rate Coefficients for Transitions in Fe XXI. *Kanti M. Aggarwal.* 77, 677, 54-A1 (1991)
- ### TRANSITION RATES
- Collisional Excitation and Radiative Properties of N II: The Strong Intercombination ( $^1D-^3P^o$ ) Transition at 748 Å. *T. M. Tripp, D. E. Shemansky, G. K. James, & J. M. Ajello.* 368, 641, 33-B6 (1991)
- High-Resolution Absorption Cross Sections of Carbon Monoxide Bands at 295 K between 91.7 and 100.4 Nanometers. *G. Stark, K. Yoshino, Peter L. Smith, K. Ito, & W. H. Parkinson.* 369, 574, 44-G13 (1991)
- Cross Sections for Production of H(2p, 2s, 1s) by Electron Collisional Dissociation of H<sub>2</sub>. *J. M. Ajello, D. E. Shemansky, & G. K. James.* 371, 422, 65-D5 (1991)
- Accurate Oscillator Strengths of Astrophysical Interest for Neutral Oxygen. *E. Biémont, A. Hibbert, M. Godefroid, N. Vaeck, & B. C. Fawcett.* 375, 818, 122-G1 (1991)
- Effective Collision Strengths among Fine-Structure Levels of Ca XV: Erratum. *K. M. Aggarwal, K. A. Berrington, & F. P. Keenan.* 77, 441, 50-F1 (1991)
- ### TURBULENCE
- On the Transport and Acceleration of Solar Flare Particles in a Coronal Loop. *James M. Ryan & Martin A. Lee.* 368, 316, 26-A7 (1991)
- Turbulent Compressible Convection. *Fausto Cattaneo, Nicholas H. Brummell, Juri Toomre, Andrea Malagoli, & Neal E. Hurlburt.* 370, 282, 50-F10 (1991)
- Stellar Turbulent Convection: A New Model and Applications. *V. M. Canuto & I. Mazzitelli.* 370, 295, 51-A1 (1991)
- VLA and VLBI Angular Broadening Measurements: The Distribution of Interstellar Scattering at Low Galactic Latitudes. *A. L. Fey, S. R. Spangler, & J. M. Cordes.* 372, 132, 75-F1 (1991)
- Thermal and Mechanical Damping of Solar p-Modes. *Peter Goldreich & Pawan Kumar.* 374, 366, 102-F1 (1991)
- Consequences of Strong Pitch-Angle Diffusion of Particles in Solar Flares. *P. A. Bespalov, V. V. Zaitsev, & A. V. Stepanov.* 374, 369, 102-F5 (1991)
- On the Orbital Circularization of Close Binaries. *Itzhak Goldman & Tsvi Mazeh.* 376, 260, 128-B8 (1991)
- The Dissipation of Magnetohydrodynamic Turbulence Responsible for Interstellar Scintillation and the Heating of the Interstellar Medium. *Steven R. Spangler.* 376, 540, 133-B5 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Evidence for Photospheric Microturbulence in Early O Stars: Are Surface Gravities Systematically Underestimated? *I. Hubeny, S. R. Heap, & B. Altenor.* 377, L33, 143-D11 (1991)
- On Molecular Cloud Scaling Laws and Star Formation. *R. N. Henriksen.* 377, 500, 146-A1 (1991)
- The Edges of Molecular Clouds: Fractal Boundaries and Density Structure. *E. Falgarone, T. G. Phillips, & C. K. Walker.* 378, 186, 153-C8 (1991)
- Turbulence, Convection, and Stability in Accretion Disks. *César Meirelles Filho.* 378, 266, 154-C4 (1991)
- Coherent Radiation from Energetic Electron Streams via Collisionless Bremsstrahlung in Strong Plasma Turbulence. *James C. Weatherall & Gregory Benford.* 378, 543, 159-B8 (1991)

- Dynamo Magnetic Field Modes in Thin Astrophysical Disks: An Adiabatic Computational Approximation. *T. F. Stepinski & E. H. Levy.* 379, 343, 167-C9 (1991)
- Turbulently Generated Magnetic Fields in Clusters of Galaxies. *Itzhak Goldman & Yoel Rephaeli.* 380, 344, 182-E8 (1991)
- Time Variability of Pulsar Dispersion Measures. *J. A. Phillips & A. Wolszczan.* 382, L27, 205-D1 (1991)
- ### ULTRAVIOLET: GENERAL
- A Search for Circumstellar Dust around HR 10, a Proposed  $\beta$  Pictoris Star. *Kwang-Ping Cheng, C. A. Grady, & Frederick C. Bruhweiler.* 366, L87, 11-E7 (1991)
- The Imaging Performance of the *Hubble Space Telescope*. *Christopher J. Burrows, Jon A. Holtzman, S. M. Faber, Pierre Y. Bely, Hashima Hasan, C. R. Lynds, & Daniel Schroeder.* 369, L21, 45-C1 (1991)
- First Results from the Faint Object Camera: SN 1987A. *P. Jakobson, R. Albrecht, C. Barbieri, J. C. Blades, A. Boksenberg, P. Crane, J. M. Deharveng, M. J. Disney, T. M. Kampferman, I. R. King, F. Macchetto, C. D. Mackay, F. Paresce, G. Weigelt, D. Baxter, P. Greenfield, R. Jedrzejewski, A. Nota, W. B. Sparks, R. P. Kirshner, & N. Panagia.* 369, L63, 46-B1 (1991)
- Evidence for a 250 Second Brightness Oscillation at 1600 Å in the Solar Temperature Minimum Region. *J. W. Cook & J. A. Ewing.* 371, 804, 71-E5 (1991)
- Vacuum Ultraviolet Imagery of the Virgo Cluster Region. III. Diffuse Far-Ultraviolet Radiation at High Galactic Latitudes. *Takashi Onaka & Keiichi Kodaira.* 379, 532, 171-C5 (1991)
- Spectroscopic Limits to an Extragalactic Far-Ultraviolet Background. *Christopher Martin, Mark Hurwitz, & Stuart Bowyer.* 379, 549, 171-D10 (1991)
- ### ULTRAVIOLET: SPECTRA
- Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. I. An 8 Month Campaign of Monitoring NGC 5548 with *IUE*. *J. Clavel, G. A. Reichert, D. Allou, D. M. Crenshaw, G. Kriss, J. H. Krolik, M. A. Malkan, H. Netzer, B. M. Peterson, W. Wamsteker, A. Altamore, T. Baribaud, P. Barr, S. Beck, L. Binette, G. E. Bromage, N. Brosch, A. I. Diaz, A. V. Filippenko, K. Fricke, C. M. Gaskell, P. Giommi, I. S. Glass, C. Gonidakis, R. L. Hackney, J. P. Halpern, D. J. Hutter, S. Jörsäter, A. L. Kinney, W. Kollatschny, A. Koratkar, K. T. Korista, A. Laor, J.-P. Lasota, E. Leibowitz, D. Maoz, P. G. Martin, T. Mazeh, E. J. A. Meurs, A. D. Nair, P. O'Brien, D. Pelat, E. Perez, G. C. Perola, R. L. Ptak, P. Rodriguez-Pascual, E. I. Rosenblatt, A. C. Sadun, M. Santos-Lleo, R. A. Shaw, P. S. Smith, G. M. Stirpe, R. Stoner, W. H. Sun, M.-H. Ulrich, E. van Groningen, & W. Zheng.* 366, 64, 1-G7 (1991)
- Circumstellar Material around the Massive Close Binary DH Cephei. *M. F. Corcoran.* 366, 308, 4-G8 (1991)
- A Study of the Ultraviolet Evolution of U Geminorum between Outbursts. *Alan L. Kiplinger, Edward M. Sion, & Paula Szkody.* 366, 569, 10-B1 (1991)
- Stellar Lyman-Alpha Emission and the Local Interstellar Medium. *Wayne Landsman & Theodore Simon.* 366, L79, 11-D9 (1991)
- The Circumstellar Disks of  $\beta$  Pictoris Analogs. *C. A. Grady, Frederick C. Bruhweiler, K. P. Cheng, W. A. Chu, & Y. Kondo.* 367, 296, 15-F9 (1991)
- Circumstellar Material around  $\lambda$  Eridani (B2e). I. Geometry and Kinematics during 1987–1988. *Myron A. Smith, Geraldine J. Peters, & C. A. Grady.* 367, 302, 15-G1 (1991)
- PW Vulpeculae: A Nova with Nearly Solar Abundances. *Pedro Saizar, Summer Starrfield, Gary J. Ferland, R. Mark Wagner, James W. Truran, Scott J. Kenyon, Warren M. Sparks, Robert E. Williams, & L. L. Stryker.* 367, 310, 15-G11 (1991)
- Dark Matter Decay and the Temperature of Lyman-Alpha Clouds. *D. W. Sciama.* 367, L39, 22-A11 (1991)
- Simulated Optical Images of Galaxies at  $z \sim 1$  Using Ultraviolet Images of Nearby Galaxies. *Ralph C. Bohlin, Robert H. Cornett, Jesse K. Hill, Robert S. Hill, Wayne B. Landsman, Robert W. O'Connell, Susan G. Neff, Andrew M. Smith, & Theodore P. Stecher.* 368, 12, 23-C1 (1991)
- Coordinated X-Ray, Ultraviolet, and Optical Observations of 3C 120. *L. Maraschi, L. Chiappetti, R. Falomo, B. Garilli, M. Malkan, G. Tagliaferri, E. G. Tanzi, & A. Treves.* 368, 138, 24-F9 (1991)

- Ultraviolet Interstellar Lines in the Spectrum of  $\pi$  Scorpii Recorded at 2 Kilometers per Second Resolution.** Charles L. Joseph & Edward B. Jenkins. 368, 201, 25-E9 (1991)
- On Winds and X-Rays of O-Type Stars.** Tomasz Chlebowksi & Catharine D. Garmann. 368, 241, 26-B1 (1991)
- Energy Distributions of Symbiotic Novae.** Greg L. Bryan & Sun Kwok. 368, 252, 26-C1 (1991)
- New Ultraviolet Spectroscopic Features Found in Comet Brorsen-Metcalf (1989o).** C. R. O'Dell, Christopher O. Miller, Anita L. Cochran, William D. Cochran, Chet B. Opal, & Edwin S. Barker. 368, 616, 32-G1 (1991)
- Collisional Excitation and Radiative Properties of N II: The Strong Intercombination ( $^1D - ^3P^0$ ) Transition at 748 Å.** T. M. Tripp, D. E. Shemansky, G. K. James, & J. M. Ajello. 368, 641, 33-B6 (1991)
- Predicted Profiles of Ultraviolet Interstellar Absorption Lines.** D. E. Welty, L. M. Hobbs, & D. G. York. 75, 425, 6-E5 (1991)
- A Spectrophotometric Atlas of White Dwarfs Compiled from the IUE Archives.** Gary Wegner & Steven R. Swanson. 75, 507, 7-E13 (1991)
- Criteria for the Spectral Classification of B Stars in the Ultraviolet.** Janet Rountree & George Sonneborn. 369, 515, 44-B5 (1991)
- High-Resolution Absorption Cross Sections of Carbon Monoxide Bands at 295 K between 91.7 and 100.4 Nanometers.** G. Stark, K. Yoshino, Peter L. Smith, K. Ito, & W. H. Parkinson. 369, 574, 44-G13 (1991)
- Multiwavelength Observations of Nova LMC 1990 Number 2: The First Extragalactic Recurrent Nova.** Steven N. Shore, George Sonneborn, Sumner G. Starrfield, M. Hamuy, R. E. Williams, A. Cassatella, & H. Drechsel. 370, 193, 49-E8 (1991)
- A Critical Analysis of the Ultraviolet Temperature Scale of the Helium-dominated DB and DBV White Dwarfs.** Peter Thejll, Stéphane Vennes, & Harry L. Shipman. 370, 355, 51-F5 (1991)
- An Ultraviolet Atlas of Quasar and Blazar Spectra.** A. L. Kinney, R. C. Bohlin, J. C. Blades, & D. G. York. 75, 645, 10-C7 (1991)
- Structure and Kinematics of the Broad-Line Regions in Active Galaxies from IUE Variability Data.** Anuradha P. Koratkar & C. Martin Gaskell. 75, 719, 11-B5 (1991)
- The Solar Spectrum between 914 and 1177 Å.** U. Feldman & G. A. Doschek. 75, 925, 14-B13 (1991)
- The Shape of the Ultraviolet Continuum of Quasars and Intergalactic Dust.** F. H. Cheng, C. Martin Gaskell, & Anuradha P. Koratkar. 370, 487, 54-D9 (1991)
- The Ultraviolet Spectrum of Scorpius X-1 as Observed by IUE: 1978–1988.** T. R. Kallman, J. C. Raymond, & S. D. Vrtilek. 370, 717, 57-C11 (1991)
- C IV Line Profile Correlations in NGC 4151.** R. P. Fahey, A. G. Michalitsianos, & D. Kazanas. 371, 136, 61-F9 (1991)
- The Ionization Structure of Planetary Nebulae. X. NGC 2392.** Timothy Barker. 371, 217, 62-G5 (1991)
- The Ultraviolet Continuum and the Fluorescent H<sub>2</sub> Lines in Low-Excitation Herbig-Haro Objects.** K.-H. Böhm, D. M. Scott, & J. Sofi. 371, 248, 63-C1 (1991)
- High-Resolution Studies of the Structure of the Solar Atmosphere Using a New Imaging Algorithm.** Margarita Karovska & Shadia Rifai Habbal. 371, 402, 65-B1 (1991)
- Premaximum Observations of the Type Ia SN 1990N.** Bruno Leibundgut, Robert P. Kirshner, Alexei V. Filippenko, Joseph C. Shields, Craig B. Foltz, Mark M. Phillips, & George Sonneborn. 371, L23, 66-D1 (1991)
- Mass Outflow in the Nearby Proto-Planetary System  $\beta$  Pictoris.** Frederick C. Bruhweiler, Yoji Kondo, & C. A. Grady. 371, L27, 66-D7 (1991)
- Ultraviolet Variability of NGC 5548: Dynamics of the Continuum Production Region and Geometry of the Broad-Line Region.** J. H. Krolik, Keith Horne, T. R. Kallman, M. A. Malkan, R. A. Edelson, & G. A. Kiss. 371, 541, 68-C6 (1991)
- Observations of the Peculiar Object MWC 560 in Outburst.** A. G. Michalitsianos, S. P. Maran, R. J. Oliversen, B. Bopp, E. Kontizas, A. Dapergolas, & M. Kontizas. 371, 761, 71-A7 (1991)
- Spectral Observations of the Extreme Ultraviolet Background.** Simon E. Labov & Stuart Bowyer. 371, 810, 71-F1 (1991)
- An Ultraviolet Spectral Atlas of a Sunspot and an Active Region 1190–1730 Å.** P. Brekke, O. Kjeldseth-Moe, J.-D. F. Bartoe, & G. E. Brueckner. 75, 1337, 23-C1 (1991)
- Ultraviolet Interstellar Absorption toward HD 156359, a Halo Star at 11 Kiloparsecs in the Direction  $l = 329^\circ$  and  $b = -15^\circ$ .** Kenneth R. Sembach, Blair D. Savage, & Derck Massa. 372, 81, 75-A11 (1991)
- The Albedo and Scattering Phase Function of Interstellar Dust and the Diffuse Background at Far-Ultraviolet Wavelengths.** Mark Hurwitz, Stuart Bowyer, & Christopher Marin. 372, 167, 76-A12 (1991)
- The Isolated Massive DA White Dwarf GD 50.** P. Bergeron, K. M. Kidder, J. B. Holberg, James Liebert, F. Wesemael, & Rex A. Saffer. 372, 267, 77-CS (1991)
- Rapid Ultraviolet Variability in the BL Lacertae Object PKS 2155–304.** R. A. Edelson, J. Saken, G. Pike, C. M. Urry, I. M. George, R. S. Warwick, H. R. Miller, M. T. Carini, & J. R. Webb. 372, L9, 79-B5 (1991)
- The Binary Feige 24: The Mass, Radius, and Gravitational Redshift of the DA White Dwarf.** Stéphane Vennes, John R. Thorstensen, Peter Thejll, & Harry L. Shipman. 372, L37, 79-E5 (1991)
- The Local Interstellar Medium toward the Center of Loop I.** Miriam Centurion & Giovanni Vladilo. 372, 494, 82-A1 (1991)
- Classical Cepheid Luminosities from Binary Companions.** Nancy Remage Evans. 372, 597, 83-B1 (1991)
- Rotational Modulation in IUE Spectra of Cool Dwarf Chromospheres. I. Data Analysis and Period Search Techniques.** K. L. Hallam, B. Aliner, & A. S. Endal. 372, 610, 83-C1 (1991)
- Systematic Radial Flows in the Chromosphere, Transition Region, and Corona of the Quiet Sun.** Donald M. Hassler, Gary J. Rottman, & Frank Q. Orrall. 372, 710, 84-E1 (1991)
- The Ultraviolet Spectrum and Continuum Energy Distribution of the Bright Quasar H1821+643.** Michiel Kolhman, Jules P. Halpern, Chris R. Shrader, & Alexei V. Filippenko. 373, 57, 86-F8 (1991)
- Si IV and C IV Resonance Lines as Indicators of Massive Stars in Starburst Galaxies.** Claus Leitherer & Henry J. G. L. M. Lamers. 373, 89, 87-B6 (1991)
- The Interoutburst Behavior of Cataclysmic Variables.** Paula Szkody, Janet A. Mattei, Elizabeth O. Waagen, & Clay Stablein. 76, 359, 29-E1 (1991)
- High-Resolution IUE Spectra of the Nova-like Variable IX Velorum.** Christopher W. Mauche. 373, 624, 95-F7 (1991)
- Bowen Fluorescence in AM Herculis Stars.** Jonathan Schacter, Alexei V. Filippenko, Steven M. Kahn, & Frits B. S. Paerels. 373, 633, 95-G4 (1991)
- Ultraviolet High-Excitation Fe II Fluorescence Lines Excited by O VI, C IV, and H I Resonance Emission As Seen in IUE Spectra.** Walter A. Feibelman, Frederick C. Bruhweiler, & Sveneric Johansson. 373, 649, 96-A8 (1991)
- Fe XIV Line Ratios in the Sun.** F. P. Keenan, P. L. Dufton, M. B. Boylan, A. E. Kingston, & K. G. Widing. 373, 695, 96-E13 (1991)
- New Observations of the Gas Cloud Associated with the Quasar-Galaxy Pair 3C 232/NGC 3067.** John T. Stocke, James Case, Megan Donahue, J. Michael Shull, & Theodore P. Snow. 374, 72, 98-G7 (1991)
- Far-Ultraviolet Mapping of the Cygnus Loop with the Voyager 2 Ultraviolet Spectrometer.** William P. Blair, Knox S. Long, Olaf Vancura, & J. B. Holberg. 374, 202, 100-E5 (1991)
- Inefficient Accretion by the DA2 White Dwarf in V471 Tauri.** D. J. Mullan, H. L. Shipman, E. M. Sion, & J. MacDonald. 374, 707, 107-G8 (1991)
- X-Ray to Infrared Observations of the AM Herculis System E1405–451 (V834 Centauri).** R. M. Sambruna, L. Chiappetti, A. Treves, J. M. Bonnet-Bidaud, P. Bouchet, L. Maraschi, C. Moioli, & M. Mouchez. 374, 744, 108-C10 (1991)
- IUE Observations of NGC 5548, 1978–1988: The Sizes and Kinematics of the Broad-Line Region.** Anuradha P. Koratkar & C. Martin Gaskell. 375, 85, 112-A13 (1991)
- A Spectroscopic Search for Colliding Stellar Winds in O-Type Close Binary Systems. I. AO Cassiopeiae.** Douglas R. Gies & Michael S. Wiggs. 375, 321, 114-G10 (1991)
- The Ultraviolet Spectrum of KX Trianguli Australis.** Walter A. Feibelman. 375, 335, 115-A12 (1991)

- IUE Observations of Early-Type Stars at High Galactic Latitudes.* D. A. Quin, P. J. F. Brown, E. S. Conlon, P. L. Dufton, & F. P. Keenan. 375, 342, 115-B7 (1991)
- The Many Faces of F Stars: A Rotational Modulation Study of Capella, Procyon, and Caph with the International Ultraviolet Explorer.* Thomas R. Ayres. 375, 704, 121-D11 (1991)
- Absolute Far-Ultraviolet Spectrophotometry of Hot Subluminous Stars from Voyager.* J. B. Holberg, B. Ali, T. E. Carone, & R. S. Polidan. 375, 716, 121-E11 (1991)
- The Chromospheric Emission-Age Relation for Stars of the Lower Main Sequence and Its Implications for the Star Formation Rate.* David R. Soderblom, Douglas K. Duncan, & Dean R. H. Johnson. 375, 722, 121-F5 (1991)
- Tomographic Separation of Composite Spectra: The Components of the O-Star Spectroscopic Binary AO Cassiopeiae.* William G. Baguado, Jr., & Douglas R. Gies. 376, 266, 128-C1 (1991)
- Ultraviolet Variability of the Massive W-R Binary System HDE 311884 = WR 47.* Gloria Koenigsberger, Anthony F. J. Moffat, & Lawrence H. Auer. 376, 272, 128-C9 (1991)
- Observations of Scorpius X-1 with IUE: Ultraviolet Results from a Multiwavelength Campaign.* S. D. Vrilek, W. Penninx, J. C. Raymond, F. Verbunt, P. Hertz, K. Wood, W. H. G. Lewin, & K. Mitsuda. 376, 278, 128-D1 (1991)
- The Featureless Continua and Hydrogen Lines of Seyfert 2 Galaxies.* A. L. Kinney, R. R. J. Antonucci, M. J. Ward, A. S. Wilson, & M. Whittle. 377, 100, 139-C5 (1991)
- Ultraviolet and Optical Spectroscopy of the R Aquarii Symmetrical Jet.* J. M. Hollis, R. J. Oliver, M. Kafatos, A. G. Michalitsianos, & R. M. Wagner. 377, 227, 140-F11 (1991)
- Ultraviolet Fe VII Absorption and Fe II Emission Lines of Central Stars of Planetary Nebulae.* Kwang-Ping Cheng, Walter A. Feibelman, & Frederick C. Bruhweiler. 377, 235, 140-G7 (1991)
- Far-Ultraviolet Spectroscopy of the Quasar UM 675 with the Faint Object Spectrograph on the Hubble Space Telescope.* E. A. Beaver, E. M. Burbidge, Ross D. Cohen, Vesa T. Junkkarinen, Ronald W. Lyons, E. I. Rosenblatt, George F. Hartig, Bruce Margon, & A. F. Davidsen. 377, L1, 143-B1 (1991)
- Faint Object Spectrograph Spectroscopy of Resolved Structure in the Nucleus of NGC 1068.* S. Caganoff, R. R. J. Antonucci, H. C. Ford, G. A. Kriss, G. Hartig, L. Armus, I. N. Evans, E. Rosenblatt, R. C. Bohlin, & A. L. Kinney. 377, L9, 143-B11 (1991)
- Faint Object Spectrograph Observations of the Low-Luminosity Seyfert Galaxy NGC 1566.* G. A. Kriss, G. F. Hartig, L. Armus, William P. Blair, S. Caganoff, & L. Dressel. 377, L13, 143-C1 (1991)
- First Results from the Goddard High-Resolution Spectrograph: The Galactic Halo and the Ly $\alpha$  Forest at Low Redshift in 3C 273.* Simon L. Morris, Ray J. Weymann, Blair D. Savage, & Ronald L. Gilliland. 377, L21, 143-C11 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Spectroscopic Determination of Stellar Parameters of Melnick 42, an O3 Star in the Large Magellanic Cloud.* S. R. Heap, B. Altnier, D. Ebbets, I. Hubeny, J. B. Hutchings, R. P. Kudritzki, S. A. Voels, S. Haser, A. Pauldrach, J. Puls, & K. Butler. 377, L29, 143-D6 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Evidence for Photospheric Microturbulence in Early O Stars: Are Surface Gravities Systematically Underestimated?* I. Hubeny, S. R. Heap, & B. Altnier. 377, L33, 143-D11 (1991)
- First Results from the Goddard High-Resolution Spectrograph: High-Resolution Observations of the 1942 Å Resonance Line of Hg II in the Chemically Peculiar B Star, x Lupi.* David S. Leckrone, Glenn M. Wahlgren, & Sveneric G. Johansson. 377, L37, 143-E1 (1991)
- First Results from the Goddard High-Resolution Spectrograph: A Demonstration of Spectral Resolution and Experiments with Deconvolution.* Glenn M. Wahlgren, David S. Leckrone, Steven N. Shore, Don J. Lindler, Ronald L. Gilliland, & Dennis C. Ebbets. 377, L41, 143-E6 (1991)
- First Results from the Goddard High-Resolution Spectrograph: The Chromosphere of  $\alpha$  Tauri.* Kenneth G. Carpenter, Richard D. Robinson, Glenn M. Wahlgren, Thomas B. Ake, Dennis C. Ebbets, Jeffrey L. Linsky, Alexander Brown, & Frederick M. Walter. 377, L45, 143-E11 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Resolved Velocity and Density Structure in the  $\beta$  Pictoris Circumstellar Gas.* A. Bogoss, Frederick C. Bruhweiler, C. A. Grady, Dennis C. Ebbets, Yoji Kondo, L. M. Trafton, John C. Brandt, & S. R. Heap. 377, L49, 143-F1 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Element Abundances as a Function of Velocity in the Neutral Gas toward  $\xi$  Persei.* Blair D. Savage, Jason A. Cardelli, Frederick C. Bruhweiler, Andrew M. Smith, Dennis C. Ebbets, & Kenneth R. Sembach. 377, L53, 143-F6 (1991)
- First Results from the Goddard High-Resolution Spectrograph: Elemental Abundances in the Diffuse Clouds toward  $\xi$  Persei.* Jason A. Cardelli, Blair D. Savage, Frederick C. Bruhweiler, Andrew M. Smith, Dennis C. Ebbets, Kenneth R. Sembach, & Ulysses J. Sofia. 377, L57, 143-F11 (1991)
- First Results from the Goddard High-Resolution Spectrograph: C I, S I, and CO toward  $\xi$  Persei and the Physical Conditions in Diffuse Clouds.* Andrew M. Smith, Frederick C. Bruhweiler, David L. Lambert, Blair D. Savage, Jason A. Cardelli, Dennis C. Ebbets, Cheng-Hsuan Lyu, & Yaron Shefer. 377, L61, 143-G1 (1991)
- IUE Investigation of Mass Flow in the Interacting Binary U Sagittae.* George E. McCluskey, Jr., Carolina Paciencia Salas McCluskey, & Yoji Kondo. 378, 281, 154-D9 (1991)
- A Cool Supergiant with Anomalous Behavior of the 2800 Mg II Doublet.* G. A. Gurzadyan, Y. Kondo, S. S. Rustambekyan, Yervant Terzian, & Mario R. Perez. 378, 298, 154-F1 (1991)
- Heating Mechanism(s) for Transition Layers in Giants.* Erika Böhm-Vitense & José Mena-Werth. 378, 718, 161-C8 (1991)
- The Great Flare of 1985 April 12 on AD Leonis.* Suzanne L. Hawley & Björn R. Pettersson. 378, 725, 161-D1 (1991)
- The Analysis of Apparent Optical Depth Profiles for Interstellar Absorption Lines.* Blair D. Savage & Kenneth R. Sembach. 379, 245, 166-B5 (1991)
- The 3s<sup>2</sup>3p 2P-3s3p 2P Intercombination Lines of Fe XIV in the Sun.* F. P. Keenan, P. L. Dufton, E. S. Conlon, M. B. Boylan, A. E. Kingston, & K. G. Widing. 379, 406, 168-A11 (1991)
- Discovery of a Fast Radiative Shock Wave in the Cygnus Loop Using the Hopkins Ultraviolet Telescope.* William P. Blair, Knox S. Long, Olaf Vancura, Charles W. Bowers, Arthur F. Davidsen, W. Van Dyke Dixon, Samuel T. Durrance, Paul D. Feldman, Henry C. Ferguson, Richard C. Henry, Randy A. Kimble, Gerard A. Kriss, Jeffrey W. Kruk, H. Warren Moos, & Theodore R. Gull. 379, L33, 169-D1 (1991)
- Observations of Comet Levy (1990c) with the Hopkins Ultraviolet Telescope.* P. D. Feldman, A. F. Davidsen, W. P. Blair, C. W. Bowers, W. V. Dixon, S. T. Durrance, H. C. Ferguson, R. C. Henry, R. A. Kimble, G. A. Kriss, J. W. Kruk, K. S. Long, H. W. Moos, O. Vancura, & T. R. Gull. 379, L37, 169-D7 (1991)
- Fe II Emission Lines. I. Chromospheric Spectra of Red Giants.* P. G. Judge & C. Jordan. 77, 75, 44-E1 (1991)
- Atomic Data for Resonance Absorption Lines. I. Wavelengths Longward of the Lyman Limit.* Donald C. Morton. 77, 119, 45-B1 (1991)
- IUE Observations of NGC 1068: The Extremely Luminous Starburst Knots.* F. C. Bruhweiler, K. Q. Truong, & B. Altnier. 379, 596, 172-B1 (1991)
- IUE Observations of NGC 1068: The Extended High-Ionization Emission Region.* K. Q. Truong & F. C. Bruhweiler. 379, 609, 172-C1 (1991)
- Wind Collision Effects in the Early-Type Close Binaries HD 47129 and AO Cassiopeiae.* Jorge Sahade & Estela Brandi. 379, 706, 173-E1 (1991)
- Chromospheric and Transition Region Diagnostics Using Emission-Line Intensities.* R. Grant Athay & K. P. Dere. 379, 776, 174-D1 (1991)
- The Onset of Chromospheric Activity among the A and F Stars.* Theodore Simon & Wayne Landsman. 380, 200, 178-E3 (1991)
- Predicted Extreme-Ultraviolet Line Emission for Nearby Main-Sequence B Stars.* J. J. MacFarlane, J. P. Cassinelli, B. Y. Welsh, P. W. Vedder, J. V. Vallerga, & W. L. Waldron. 380, 564, 185-C1 (1991)
- Circumstellar Emission from SN 1987A.* Peter Lundqvist & Claes Fransson. 380, 575, 185-D1 (1991)

- A Non-Local Thermodynamic Equilibrium, Line-blanketed Synthetic Spectrum of Iota Herculis: C, Al, and Si Lines.** *James A. Grigsby.* 380, 606, 185-F9 (1991)
- Probing the Galactic Halo along the 3C 273 Sight Line Using IUE.** *Geoffrey S. Burks, Donald G. York, J. Chris Blades, Ralph C. Bohlin, & Willem Wamsteker.* 381, 55, 189-F5 (1991)
- Velocity Gradients in the Chromosphere-Corona Transition Region.** *R. Grant Athay & K. P. Dere.* 381, 323, 193-A6 (1991)
- The Evolution of the Diffuse Cosmic Ultraviolet Background Constrained by Hubble Space Telescope Observations of 3C 273.** *Satoru Ikeuchi & Edwin L. Turner.* 381, L1, 194-A9 (1991)
- Spectroscopy of Z Camelopardalis in Outburst with the Hopkins Ultraviolet Telescope.** *Knox S. Long, William P. Blair, Arthur F. Davidsen, Charles W. Bowers, W. Van Dyke Dixon, Samuel T. Durrance, Paul D. Feldman, Richard C. Henry, Gerard A. Kris, Jeffrey W. Kruk, H. Warren Moos, Olaf Vancura, Henry C. Ferguson, & Randy A. Kimble.* 381, L25, 194-D5 (1991)
- IUE Spectra of the Eclipsing Binary NN Serpentis.** *Janet H. Wood & Thomas R. Marsh.* 381, 551, 197-E1 (1991)
- Relative Abundances in the Lower Solar Transition Region.** *G. A. Doschek, K. P. Dere, & P. A. Lund.* 381, 583, 198-A1 (1991)
- Improved Line Ratio Calculations Involving  $\Delta n = 1$  (2-3) Transitions in O V and a Reanalysis of Skylab Observations of Solar Flares.** *E. P. Keenan, P. L. Dufton, L. K. Harra, E. S. Conlon, K. A. Berrington, A. E. Kingston, & K. G. Widing.* 382, 349, 204-E1 (1991)
- The Ultraviolet Spectrum of NGC 4151 from 1978 to 1990: General Characteristics and Evolution.** *M.-H. Ulrich, A. Boksenberg, G. E. Bromage, J. Clavel, A. Elvius, M. V. Penston, G. C. Perola, & M. A. J. Snijders.* 382, 483, 207-E7 (1991)
- The Connection between Coronal Bright Points and the Variability of the Quiet-Sun Extreme-Ultraviolet Emission.** *Shadia Rifai Habbal & Edmund Grace.* 382, 667, 209-G11 (1991)
- Inference of the Extreme-Ultraviolet Continuum Shape of Quasars.** *Wei Zheng.* 382, L55, 211-A11 (1991)
- Constraints on the Origin of the Ultraviolet Upturn in Elliptical Galaxies from Hopkins Ultraviolet Telescope Observations of NGC 1399.** *Henry C. Ferguson, Arthur F. Davidsen, Gerard A. Kris, William P. Blair, Charles W. Bowers, W. Van Dyke Dixon, Samuel T. Durrance, Paul D. Feldman, Richard C. Henry, Jeffrey W. Kruk, H. Warren Moos, Olaf Vancura, Knox S. Long, & Randy A. Kimble.* 382, L69, 211-C1 (1991)
- First Ultraviolet Spectropolarimetry of Hot Supergiants.** *M. Taylor, A. D. Code, K. H. Nordsieck, C. M. Anderson, B. L. Babler, K. S. Bjorkman, G. C. Clayton, A. M. Magalhães, M. R. Meade, R. E. Schulte-Ladbeck, & B. A. Whitney.* 382, L85, 211-D5 (1991)
- Hydrogenated Amorphous Carbon Grains and the 2175 Å Interstellar Hump.** *Armando Blanco, Ezio Bussoletti, Luigi Colangeli, Sergio Fonti, & John R. Stephens.* 382, L97, 211-E8 (1991)
- Determination of Ionic Abundances in the Io Torus Using the Hopkins Ultraviolet Telescope.** *H. W. Moos, P. D. Feldman, S. T. Durrance, W. P. Blair, C. W. Bowers, A. F. Davidsen, W. V. Dixon, H. C. Ferguson, R. C. Henry, R. A. Kimble, G. A. Kris, J. W. Kruk, K. S. Long, & O. Vancura.* 382, L105, 211-F3 (1991)
- The Ultraviolet Spectra of Nearby Radio Galaxies.** *William C. Keel & Rogier A. Windhorst.* 383, 135, 213-F3 (1991)
- Constraints on the Optical Properties of Interstellar Dust in the Far-Ultraviolet: Voyager Observations of the Diffuse Sky Background.** *Jayant Murthy, R. C. Henry, & J. B. Holberg.* 383, 198, 214-E1 (1991)
- Interstellar Gas Phase Abundance of Carbon, Oxygen, Nitrogen, Copper, Gallium, Germanium, and Krypton toward  $\zeta$  Ophiuchi.** *Jason A. Cardelli, Blair D. Savage, & Dennis C. Ebbets.* 383, L23, 219-D1 (1991)
- IUE Observations of Solar-Type Stars in the Pleiades and the Hyades.** *Jean-Pierre Caillaud, Osmi Vilhu, & Jeffrey L. Linsky.* 383, 594, 221-F1 (1991)
- An Interactive Companion to the S Star HD 35155.** *Thomas B. Ake III, Hollis R. Johnson, & Mudhafer M. Ameen.* 383, 842, 224-F7 (1991)
- First Ultraviolet Spectropolarimetry of Be Stars from the Wisconsin Ultraviolet Photo-Polarimeter Experiment.** *K. S. Bjorkman, K. H. Nordsieck, A. D. Code, C. M. Anderson, B. L. Babler, G. C. Clayton, A. M. Magalhães, M. R. Meade, M. A. Nook, R. E. Schulte-Ladbeck, M. Taylor, & B. A. Whitney.* 383, L67, 226-E1 (1991)
- WAVE MOTIONS**
- Nonaxisymmetric Instabilities in Rotating Shear Flows: Internal Gravity Modes in Stratified Media and Analogies with Plane Flows.** *P. Ghosh & M. A. Abramowicz.* 366, 221, 3-F13 (1991)
- Coronal Loop Heating by Wave-Particle Interactions.** *Altair S. de Assis & King H. Tsui.* 366, 324, 5-B1 (1991)
- Scattering of Acoustic Waves from a Magnetic Flux Tube Embedded in a Radiating Fluid.** *T. J. Bogdan & M. Knöller.* 369, 219, 38-F1 (1991)
- Spectral Distortions of the Microwave Background Radiation Resulting from the Damping of Pressure Waves.** *R. A. Daly.* 371, 14, 60-C3 (1991)
- Viscosity and Inertia in Cosmic-Ray Transport: Effects of an Average Magnetic Field.** *L. L. Williams & J. R. Jokipii.* 371, 639, 69-E3 (1991)
- Heating Solar Coronal Holes.** *E. N. Parker.* 372, 719, 84-E11 (1991)
- Coronal Proton Transport in the Presence of Alfvén Waves and Implications for Gamma-Ray Burst Models.** *D. F. Smith & S. H. Brecht.* 373, 289, 89-E9 (1991)
- Measurements of High-Frequency Solar Oscillation Modes.** *T. L. Duvall, Jr., J. W. Harvey, S. M. Jefferies, & M. A. Pomerantz.* 373, 308, 89-G1 (1991)
- Magnetohydrodynamic Turbulence Dissipation and Stochastic Proton Acceleration in Solar Flares.** *James A. Miller.* 376, 342, 129-B11 (1991)
- The Phase Mixing of Alfvén Waves, Coordinated Modes, and Coronal Heating.** *E. N. Parker.* 376, 355, 129-C11 (1991)
- Li Depletion in F Stars by Internal Gravity Waves.** *Ramón J. García López & Hendrik C. Spruit.* 377, 268, 141-C7 (1991)
- Alfvén Wave Trapping, Network Microflaring, and Heating in Solar Coronal Holes.** *R. L. Moore, Z. E. Musielak, S. T. Suess, & C.-H. An.* 378, 347, 155-C5 (1991)
- Diskoseismology: Probing Accretion Disks. I. Trapped Adiabatic Oscillations.** *Michael A. Nowak & Robert V. Wagoner.* 378, 656, 160-E9 (1991)
- A Mechanism for Gamma-Ray Bursts by Alfvén-Wave Acceleration in a Nonuniform Atmosphere.** *K. A. Holcomb & T. Tajima.* 378, 682, 160-G10 (1991)
- Multiple Scattering of Acoustic Waves by a Pair of Uniformly Magnetized Flux Tubes.** *Thomas J. Bogdan & David C. Fox.* 379, 758, 174-B10 (1991)
- Emission at Cyclotron Harmonics Due to Coalescence of z-Mode Waves.** *D. B. Melrose.* 380, 256, 179-C1 (1991)
- Propagation of Magnetoacoustic Waves in the Solar Atmosphere with Random Inhomogeneities of Density and Magnetic Fields.** *M. Ryutova, M. Kaisig, & T. Tajima.* 380, 268, 179-D1 (1991)
- X-RAYS: BINARIES**
- The Orbital Ephemeris and Eclipse Transitions of the Low-Mass X-Ray Binary EXO 0748-676.** *A. N. Parmar, A. P. Smale, F. Verbunt, & R. H. D. Corbet.* 366, 253, 4-B9 (1991)
- Neutron Star Crustal Plate Tectonics. I. Magnetic Dipole Evolution in Millisecond Pulsars and Low-Mass X-Ray Binaries.** *M. Ruderman.* 366, 261, 4-C5 (1991)
- Spectroscopy of FO Aquarii: Evidence for Reprocessing in a Hot Wind.** *Phillip J. Martell & Ronald H. Kaishuck.* 366, 286, 4-E5 (1991)
- Sigma Observation of the Pulsar OAO 1657-415: Precise Localization at Hard X-Ray Energy and Discovery of Spin-down.** *S. Mereghetti, J. Ballet, A. Lamberti, P. Mandrou, L. Natalucci, J. Paul, J. P. Roques, L. Salotti, M. Gilfanov, R. Sunyaev, G. Babalyan, E. Churazov, N. Khavenson, A. Kuznetsov, D. Stepanov, & S. Yunin.* 366, L23, 6-C11 (1991)
- Birthrates of Galactic Millisecond Pulsars and Their Low-Mass X-Ray Binary Precursors.** *Marco Tavani.* 366, L27, 6-D1 (1991)
- "Superlow-State" Hard X-Ray Observation of Cygnus X-1.** *P. Ubertini, A. Bazzano, F. Perotti, E. Quadrini, A. Court, A. J. Dean, N. Dipper, R. Lewis, L. Bassani, & J. B. Stephen.* 366, 544, 9-G1 (1991)
- Application of a General Relativistic Accretion Disk Model to LMC X-1, LMC X-3, X1608-522, and X1636-536.** *Ken Ebisawa, Kazuhisa Mitsuda, & Tomoyuki Hanawa.* 367, 213, 14-F8 (1991)

- Ginga Observation of an AM Herculis Type Source H0538+608.** *M. Ishida, A. Silber, H. V. Bradt, R. A. Remillard, K. Makishima, & T. Ohashi.* 367, 270, 15-D6 (1991)
- Conditions for Accretion-induced Collapse of White Dwarfs.** *Ken'ichi Nomoto & Yoji Kondo.* 367, L19, 17-D1 (1991)
- Structure of Thermal Pair Clouds around Gamma-Ray-emitting Black Holes.** *Edison P. Liang.* 367, 470, 19-C1 (1991)
- Accretion Powered Pulsars: Continuum Spectra and Light Curves of Settling Accretion Mounds.** *David J. Burnard, Jonathan Arons, & Richard I. Klein.* 367, 575, 20-D10 (1991)
- On the Detectability of Pulsars in Close Binary Systems.** *Helen M. Johnston & Shrinivas R. Kulkarni.* 368, 504, 31-D1 (1991)
- Accretion Mechanisms in the Be/X-Ray Transient System A0535+26.** *C. Motch, L. Stella, E. Janot-Pacheco, & M. Mouchet.* 369, 490, 43-G5 (1991)
- X-Ray Echoes from Gamma-Ray Bursts.** *Charles D. Dermer, Kevin C. Hurley, & Dieter H. Hartmann.* 370, 341, 51-E1 (1991)
- Problems of Ultra-High-Energy Particle Acceleration in Cygnus X-3: A Critical Reappraisal.** *Abhas Mitra.* 370, 345, 51-E7 (1991)
- Multimission Observations of 4U 1538–52.** *L. R. Cominsky & F. Moraes.* 370, 670, 56-F10 (1991)
- The Ultraviolet Spectrum of Scorpius X-1 as Observed by IUE: 1978–1988.** *T. R. Kallman, J. C. Raymond, & S. D. Vrilek.* 370, 717, 57-C11 (1991)
- The Discovery of an X-Ray Burst and a Study of Aperiodic Variability from SMC X-1.** *L. Angelini, L. Stella, & N. E. White.* 371, 332, 64-C1 (1991)
- Enhanced Winds and Tidal Streams in Massive X-Ray Binaries.** *John M. Blondin, Ian R. Stevens, & Timothy R. Kallman.* 371, 684, 70-B1 (1991)
- Accretion in Wind-driven X-Ray Sources.** *Ronald E. Taam, Albert Fu, & B. A. Fryxell.* 371, 696, 70-C1 (1991)
- Magnetic Two-Photon Scattering and Two-Photon Emission: Cross Sections and Redistribution Functions.** *S. G. Alexander & P. Mészáros.* 372, 554, 82-E11 (1991)
- Cyclotron Harmonics in Accreting Pulsars and Gamma-Ray Bursters: Effect of Two-Photon Processes.** *S. G. Alexander & P. Mészáros.* 372, 565, 82-F9 (1991)
- Stationary Accelerators around Keplerian Disks of Aligned Magnetized Collapsed Objects: Pair Production and Gamma-Ray Emission.** *K. S. Cheng & M. Ruderman.* 373, 187, 88-C9 (1991)
- The Near-Infrared Spectra of Low-Mass X-Ray Binaries and Related Objects.** *A. P. Cowley, P. C. Schmidke, D. Crampton, J. B. Hutchings, & M. Bolte.* 373, 228, 88-G1 (1991)
- Observations of Ultra-High-Energy Photons from Cygnus X-3.** *Y. Muraki, S. Shibata, T. Aoki, K. Mitsui, A. Okada, Y. Ohashi, K. Kobayakawa, H. Kojima, T. Kitamura, Y. Kato, T. Takahashi, & I. Nakamura.* 373, 657, 96-B4 (1991)
- Changes in the 11 Minute Period of 4U 1820–30.** *J. Tan, E. Morgan, W. H. G. Lewin, W. Penninx, M. van der Klis, J. van Paradijs, K. Makishima, H. Inoue, T. Dotani, & K. Mitsuda.* 374, 291, 101-F6 (1991)
- The Effects of X-Ray Illumination on Accretion Disk Interiors.** *Yuan-Kuen Ko & Timothy R. Kallman.* 374, 721, 108-A10 (1991)
- A Jet Model for a Very High State of GX 339–4.** *Sigenori Miyamoto & Shunji Kitamoto.* 374, 741, 108-C6 (1991)
- X-Ray to Infrared Observations of the AM Herculis System E1405–451 (V834 Centauri).** *R. M. Sambruna, L. Chiappetti, A. Treves, J. M. Bonnet-Bidaud, P. Bouchet, L. Maraschi, C. Motch, & M. Mouchet.* 374, 744, 108-C10 (1991)
- Detection of Coherent 7.6 Hz Oscillations during a Burst from Aquila X-1.** *R. J. Schoelkopf & R. L. Kelley.* 375, 696, 121-D1 (1991)
- Flares in the X-Ray Source EXO 2030+375.** *Krishna M. V. Apparao.* 375, 701, 121-D7 (1991)
- Cyclotron Line Features in the Spectrum of the Transient X-Ray Pulsar X0115+634.** *F. Nagase, T. Dotani, Y. Tanaka, K. Makishima, T. Mikura, T. Sakao, H. Tsunemi, S. Kitamoto, K. Tamura, A. Yoshida, & H. Nakamura.* 375, L49, 124-B11 (1991)
- The X-Ray Properties of GX 301–2 (4U 1223–62).** *F. Haberl.* 376, 245, 128-A5 (1991)
- Optical Emission Enhancements in Be Stars.** *Krishna M. V. Apparao.* 376, 256, 128-B3 (1991)
- Observations of Scorpius X-1 with IUE: Ultraviolet Results from a Multiwavelength Campaign.** *S. D. Vrilek, W. Penninx, J. C. Raymond, P. Verbunt, P. Hertz, K. Wood, W. H. G. Lewin, & K. Mitsuda.* 376, 278, 128-D1 (1991)
- SMM/HXRBS Observations of Cygnus X-1 from 1986 December to 1988 April.** *R. A. Schwartz, L. E. Orwig, B. R. Dennis, J. C. Ling, & W. A. Wheaton.* 376, 312, 128-G1 (1991)
- Mayflower Mine 1500 GV Detector: Cosmic-Ray Anisotropy and Search for Cygnus X-3.** *D. J. Cutler & D. E. Groom.* 376, 322, 128-G12 (1991)
- Collisions of Giant Stars with Compact Objects: Hydrodynamical Calculations.** *Frederic A. Rasio & Stuart L. Shapiro.* 377, 559, 146-F1 (1991)
- On the Nature and Evolution of the Windy Binary Pulsar PSR 1744–24A.** *Jacob Shaham & Marco Tavani.* 377, 588, 147-A11 (1991)
- On Spectra of X-Ray Bursters in the Expansion Phase.** *I. I. Lapidus.* 377, L93, 150-E1 (1991)
- The Einstein Objective Grating Spectrometer Survey of Galactic Binary X-Ray Sources.** *S. D. Vrilek, J. E. McClintock, F. D. Seward, S. M. Kahn, & B. J. Wargelin.* 76, 1127, 41-C1 (1991)
- Turbulence, Convection, and Stability in Accretion Disks.** *César Meirelles Filho.* 378, 266, 154-C4 (1991)
- A Model for the 35 Day Variations in the Pulse Profile of Hercules X-1.** *J. A. Pettersson, R. E. Rothschild, & D. E. Gruber.* 378, 696, 161-A11 (1991)
- A New Candidate Orbital Period for KO Velorum (E1013–477).** *K. Mukai & R. H. D. Corbet.* 378, 701, 161-B3 (1991)
- Searches for Millisecond Pulsations in Low-Mass X-Ray Binaries.** *K. S. Wood, J. P. Norris, P. Hertz, B. A. Vaughan, P. F. Michelson, K. Mitsuda, W. H. G. Lewin, J. van Paradijs, W. Penninx, & M. van der Klis.* 379, 295, 166-F9 (1991)
- X-Ray-illuminated Stellar Winds: Optically Thick Wind Models for Massive X-Ray Binaries.** *Ian R. Stevens.* 379, 310, 167-A1 (1991)
- Can Neutron Stars Ablate Their Companions?** *Amir Levinson & David Eichler.* 379, 359, 167-E1 (1991)
- Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2.** *D. Barret, S. Mereghetti, J. P. Roques, P. Mandrou, L. Salotti, F. Lebrun, Ph. Laurent, J. Ballet, E. Churazov, M. Gifanov, R. Sunyaev, N. Khavenson, I. Chuklov, B. Novikov, A. Kuznetsov, & A. Dyachkov.* 379, L21, 169-C1 (1991)
- UBVRI Photometry of Stars in the Fields of X-Ray Selected BL Lacertae Objects.** *Paul S. Smith, Buell T. Jannuzzi, & Richard Elston.* 77, 67, 44-D1 (1991)
- The Eclipsing AM Herculis Variable H1907+690.** *R. A. Remillard, B. A. Stroozas, S. Tapia, & A. Silber.* 379, 715, 173-E13 (1991)
- Discovery of a Cyclotron Resonance Feature at 30 keV from the Transient X-Ray Pulsar Cepheus X-4.** *T. Mihara, K. Makishima, S. Kamijo, T. Ohashi, F. Nagase, Y. Tanaka, & K. Koyama.* 379, L61, 175-C6 (1991)
- Discovery of Periodic Eclipses in the X-Ray Pulsar 1H 0253+193.** *Yuichi Kamata, Yuzuru Tawara, & Katsuji Koyama.* 379, L65, 175-C13 (1991)
- "Hidden" Millisecond Pulsars.** *Marco Tavani.* 379, L69, 175-D5 (1991)
- LMC X-4: Ginga Observations and Search for Orbital Period Changes.** *A. Levine, S. Rappaport, A. Putney, R. Corbet, & F. Nagase.* 381, 101, 190-C7 (1991)
- A Model of Pulsed Gamma Radiation from the X-Ray Binary Hercules X-1/HZ Herculis.** *F. A. Aharonian & A. M. Atoyan.* 381, 220, 191-F8 (1991)
- A Search for the 2.223 MeV Neutron Capture Gamma-Ray Line from the Directions of Cygnus and the Galactic Center.** *Michael J. Harris & Gerald H. Share.* 381, 439, 196-B10 (1991)
- Discovery of a Long-Term Periodic Variation in LMC X-3.** *A. P. Cowley, P. C. Schmidke, K. Ebisawa, F. Makino, R. A. Remillard, D. Crampton, J. B. Hutchings, S. Kitamoto, & A. Treves.* 381, 526, 197-C1 (1991)
- N III Line Emission in Planetary Nebulae: Not Bowen Fluorescence.** *S. O. Kastner & A. K. Bhatia.* 381, L59, 199-D7 (1991)
- Polarization Properties of Emission Lines from Relativistic Accretion Disks.** *Kaiyou Chen & Douglas M. Eardley.* 382, 125, 201-F10 (1991)

- Low-Flux Hard X-Ray Observation of Cygnus X-1.** *P. Ubertini, A. Bazzano, C. La Padula, R. K. Manchanda, V. E. Polcaro, R. Stauber, E. Kendziorra, & F. Perotti.* 383, 263, 215-D9 (1991)
- Spectral Signatures of the MeV-PeV Radiation from Accreting Neutron Stars.** *B. Rudak & P. Mészáros.* 383, 269, 215-E3 (1991)
- The Radio "Lobes" of Scorpius X-1 Are Unrelated Background Sources.** *E. B. Fomalont & B. J. Geldzahler.* 383, 289, 215-G1 (1991)
- Decrease in the Orbital Period of Hercules X-1.** *John E. Deeter, Paul E. Boynton, Sigenori Miyamoto, Shunji Kitamoto, Fumiaki Nagase, & Nobuyuki Kawai.* 383, 324, 216-C1 (1991)
- Evolution of Compact Binary Systems with X-Ray Heating.** *Amos Harpaz & Saul Rappaport.* 383, 739, 223-D3 (1991)
- X-Ray Variability of GX 339-4 in Its Very High State.** *Sigenori Miyamoto, Kazuhiro Kimura, Shunji Kitamoto, Tadayasu Dotani, & Ken Ebisawa.* 383, 784, 224-A3 (1991)
- A Study of the H $\alpha$  Line in XI735-444.** *Alan P. Smale & Robin H. D. Corbet.* 383, 853, 224-G6 (1991)
- X-RAYS: BURSTS**
- Monte Carlo Simulation of Comptonization in Plasma Accreting onto Neutron Stars.** *Tomoyuki Hanawa.* 366, 495, 9-B9 (1991)
- The Discovery of an X-Ray Burst and a Study of Aperiodic Variability from SMC X-1.** *L. Angelini, L. Stella, & N. E. White.* 371, 332, 64-C1 (1991)
- Accretion in Wind-driven X-Ray Sources.** *Ronald E. Taam, Albert Fu, & B. A. Fryxell.* 371, 696, 70-C1 (1991)
- Detection of Coherent 7.6 Hz Oscillations during a Burst from Aquila X-1.** *R. J. Schoelkopf & R. L. Kelley.* 375, 696, 121-D1 (1991)
- Flares in the X-Ray Source EXO 2030+375.** *Krishna M. V. Apparao.* 375, 701, 121-D7 (1991)
- Model Atmospheres and X-Ray Spectra of Bursting Neutron Stars.** *Jerzy Madej.* 376, 161, 127-A4 (1991)
- Magnetohydrodynamics of an Impulsively Heated, Hard X-Ray Emitting Filament.** *George Roumeliotis & A. Gordon Emslie.* 377, 685, 148-B9 (1991)
- On Spectra of X-Ray Bursters in the Expansion Phase.** *I. I. Lapidus.* 377, L93, 150-E1 (1991)
- X-Ray Detectability of Gamma-Ray Bursts from M31.** *Edison P. Liang.* 380, L55, 188-B11 (1991)
- X-RAYS: GENERAL**
- Birthrates of Galactic Millisecond Pulsars and Their Low-Mass X-Ray Binary Precursors.** *Marco Tavani.* 366, L27, 6-D1 (1991)
- Limits on the Density of Neutral Gas within 100 Parsecs from Observations of the Soft X-Ray Background.** *M. Juda, J. J. Bloch, B. C. Edwards, D. McCammon, W. T. Sanders, S. L. Snowden, & J. Zhang.* 367, 182, 14-C8 (1991)
- Comptonization of Gamma Rays by Cold Electrons.** *Yueming Xu, Randy R. Ross, & Richard McCray.* 371, 280, 63-E11 (1991)
- A Recipe for Making Hot Accretion Disks.** *Gunnlaugur Björnsson & Roland Svensson.* 371, L69, 73-C10 (1991)
- Unsaturated Comptonization of Isotropic Photon Spectra by Relativistic Electrons.** *Abraham Loeb, Christopher F. McKee, & Ofer Lahav.* 374, 44, 98-E5 (1991)
- Determination of Confidence Limits for Experiments with Low Numbers of Counts.** *Ralph P. Kraft, David N. Burrows, & John A. Nousek.* 374, 344, 102-D1 (1991)
- On the Distribution of the Diffuse Galactic Gamma-Ray Line Emissions at 1809 keV and 511 keV.** *P. von Ballmoos.* 380, 98, 177-C1 (1991)
- Search for Starbursts among X-Ray-selected Galaxies: Optical Spectroscopy.** *Antonella Fruscione & Richard E. Griffiths.* 380, L13, 181-C1 (1991)
- Supernova Remnants in Dense Clouds. I. Blast-Wave Dynamics and X-Ray Irradiation.** *B. T. Draine & D. T. Woods.* 383, 621, 222-A6 (1991)
- X-RAYS: SOURCES**
- Cosmic X-Ray Background from Hot Gas.** *R. D. Rogers & G. B. Field.* 366, 22, 1-C13 (1991)
- A New X-Ray Pulsar GS 2138+56 (Cepheus X-4).** *Katsuji Koyama, Misunobu Kawada, Yuzuru Tawara, Kazuhiro Kimura, Shunji Kitamoto, Sigenori Miyamoto, Hiroshi Tsunemi, Ken Ebisawa, & Fumiaki Nagase.* 366, L19, 6-CS (1991)
- X-Ray Luminosity Functions of Clusters of Galaxies.** *A. Cavaliere, R. Burg, & R. Giacconi.* 366, L61, 11-B11 (1991)
- The Proper Motion of the Soft X-Ray-emitting Radio Pulsar PSR 0656+14.** *R. J. Thompson, Jr., F. A. Córdova, R. M. Hjelmung, & E. B. Fomalont.* 366, L83, 11-E1 (1991)
- Dynamic Effects on Cyclotron Scattering in Pulsar Accretion Columns.** *J. J. Brainerd & P. Mészáros.* 369, 179, 38-B11 (1991)
- A Search for Periodicities in the X-Ray Emission from Cataclysmic Variables.** *Michael Eracleous, Joseph Patterson, & Jules Halpern.* 370, 330, 51-D1 (1991)
- An X-Ray Image of the Violent Interstellar Medium in 30 Doradus.** *Q. Wang & D. J. Helfand.* 370, 541, 55-B9 (1991)
- Compton Reflection in Active Galactic Nuclei and the Cosmic X-Ray Background.** *R. D. Rogers & G. B. Field.* 370, L57, 59-A11 (1991)
- Discovery of 111 Second Pulsation from the X-Ray Source Scutum X-1.** *K. Koyama, H. Kunieda, Y. Takeuchi, & Y. Tawara.* 370, L77, 59-D1 (1991)
- Dust from Early Galaxies and the X-Ray Background Radiation.** *B. Rudak & P. Mészáros.* 371, 29, 60-D5 (1991)
- EXOSAT Observations of the X-Ray Source 2S 0114+65.** *Krishna M. V. Apparao, P. Bishnu, & K. P. Singh.* 371, 772, 71-B6 (1991)
- A Recipe for Making Hot Accretion Disks.** *Gunnlaugur Björnsson & Roland Svensson.* 371, L69, 73-C10 (1991)
- Rapid Ultraviolet Variability in the BL Lacertae Object PKS 2155-304.** *R. A. Edelson, J. Saken, G. Pike, C. M. Urry, I. M. George, R. S. Warwick, H. R. Miller, M. T. Carini, & J. R. Webb.* 372, L9, 79-B5 (1991)
- Coded-Aperture Imaging of the Galactic Center Region at Gamma-Ray Energies.** *Walter R. Cook, John M. Grunsfeld, William A. Heindl, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone.* 372, L75, 85-D1 (1991)
- High-Energy X-Ray Production in a Boundary Layer of an Accreting Neutron Star.** *Tomoyuki Hanawa.* 373, 222, 88-F9 (1991)
- The Detection of X-Ray Emission from the OB Associations of the Large Magellanic Cloud.** *Q. Wang & D. J. Helfand.* 373, 497, 94-B7 (1991)
- W28 and 3C 400.2: Two Shell-like Radio Supernova Remnants with Centrally Peaked X-Ray Morphologies.** *Knox S. Long, William P. Blair, Richard L. White, & Yutaka Matsui.* 373, 567, 95-A10 (1991)
- Thermal X-Ray Emission from Classical Novae in Optical Decline.** *James MacDonald & Stéphane Vennes.* 373, L51, 97-C4 (1991)
- The Properties of X-Ray-selected Active Galactic Nuclei. I. Luminosity Function, Cosmological Evolution, and Contribution to the Diffuse X-Ray Background.** *Tommaso Maccacaro, Roberto Della Ceca, Isabella M. Gioia, Simon L. Morris, John T. Stocke, & Anna Wolter.* 374, 117, 99-D11 (1991)
- High-Speed Photometry of V404 Cygni in Outburst.** *Eric Gotthelf, Joseph Patterson, & Richard J. Stover.* 374, 340, 102-C11 (1991)
- The CfA Einstein Observatory Extended Deep X-Ray Survey.** *F. A. Primini, S. S. Murray, J. Huchra, R. Schild, R. Burg, & R. Giacconi.* 374, 440, 104-E12 (1991)
- The Detection of X-Rays from the Hot Interstellar Medium of the Large Magellanic Cloud.** *Q. Wang, T. Hamilton, D. J. Helfand, & X. Wu.* 374, 475, 105-A10 (1991)
- Bremsstrahlung and Energetic Electrons in Supernovae.** *Donald D. Clayton & Lih-Sin The.* 375, 221, 113-F12 (1991)
- The Formation and Detection of Strongly Magnetic White Dwarf Binaries in Globular Clusters.** *G. Channugam, A. Ray, & K. P. Singh.* 375, 600, 120-B9 (1991)
- Cyclotron Line Features in the Spectrum of the Transient X-Ray Pulsar X0115+634.** *F. Nagase, T. Dotani, Y. Tanaka, K. Makishima, T. Miura, T. Sakao, H. Tsunemi, S. Kitamoto, K. Tamura, A. Yoshida, & H. Nakamura.* 375, L49, 124-B11 (1991)
- Shot Model Parameters for Cygnus X-1 through Phase Portrait Fitting.** *James C. Lochner, J. H. Swank, & A. E. Szymkowiak.* 376, 295, 128-E9 (1991)
- The Einstein Observatory Extended Medium-Sensitivity Survey. II. The Optical Identifications.** *John T. Stocke, Simon L. Morris, I. M. Gioia, T. Maccacaro, R. Schild, A. Wolter, Thomas A. Fleming, & J. Patrick Henry.* 76, 813, 36-B1 (1991)
- An X-Ray Pulsator in the Direction of Molecular Cloud MBM 12 (Lynds 1457).** *K. Koyama, S. Takano, Y. Tawara, T. Matsumoto,*

- K. Noguchi, Y. Fukui, T. Iwata, N. Ohashi, K. Tatematsu, N. Takahashi, T. Umemoto, K. W. Hodapp, J. Rayner, & K. Makishima.* 377, 240, 141-A1 (1991)
- The EXOSAT High Galactic Latitude Survey. *P. Giommi, G. Tagliaferri, K. Beuermann, G. Branduardi-Raymont, R. Brissenden, U. Graser, K. O. Mason, J. D. P. Mittaz, P. Murdin, G. Pooley, H.-C. Thomas, & J. Tuohy.* 378, 77, 152-A5 (1991)
- Optical Identification of the X-Ray Source GS 2023+338 as V404 Cygni. *R. Mark Wagner, Summer G. Starrfield, Steve B. Howell, Tobias J. Kreidl, S. J. Bus, A. Cassatella, R. Bertram, & R. Fried.* 378, 293, 154-E10 (1991)
- A Compton Reflection Model for the Cosmic X-Ray and Gamma-Ray Backgrounds. *R. D. Rogers & G. B. Field.* 378, L17, 157-C1 (1991)
- Persistence and Change in the Soft X-Ray Spectrum of the Quasar PG 1211+143. *Martin Elvis, P. Giommi, Belinda J. Wilkes, & Jonathan McDowell.* 378, 537, 159-B1 (1991)
- Cross-Correlation of the X-Ray Background with Nearby Galaxies. *Keith Jahoda, Ofer Lahav, Richard F. Mushotzky, & Elihu Boldt.* 378, L37, 162-D7 (1991)
- Constraints on Models for the High- and Low-Energy X-Ray Backgrounds. *R. A. Daly.* 379, 37, 163-E1 (1991)
- LMC-2 as the Blowout of a Hot Superbubble. *Qingde Wang & David J. Helfand.* 379, 327, 167-B5 (1991)
- Discovery with the Sigma Telescope of Hard X-Rays from the Globular Cluster Terzan 2. *D. Barret, S. Mereghetti, J. P. Roques, P. Mandrou, L. Salotti, F. Lebrun, Ph. Laurent, J. Ballet, E. Churazov, M. Gilfanov, R. Sunyaev, N. Khavenson, I. Chulkov, B. Novikov, A. Kuznetsov, & A. Dyachkov.* 379, L21, 169-C1 (1991)
- Small-Scale Fluctuations and Angular Correlations of the X-Ray Background in the HEAO 1 A-2 Energy Band: Constraints on Clustering of X-Ray Sources. *J. M. Martin-Mirone, G. De Zotti, E. A. Boldt, F. E. Marshall, L. Danese, A. Franceschini, & M. Persic.* 379, 507, 171-A4 (1991)
- The Intensity and Spectrum of the Diffuse X-Ray Background. *X. Wu, T. Hamilton, D. J. Helfand, & Q. Wang.* 379, 564, 171-F1 (1991)
- Faint X-Ray Source Counts and the Origin of the X-Ray Background. *T. T. Hamilton, D. J. Helfand, & X. Wu.* 379, 576, 171-G1 (1991)
- The Luminosity Function and Cosmological Evolution of X-Ray-selected BL Lacertae Objects. *Simon L. Morris, John T. Stocke, Isabella M. Gioia, Rudy E. Schild, Anna Wolter, Tommaso Maccacaro, & Roberto Della Ceca.* 380, 49, 176-F1 (1991)
- Short-Term X-Ray Variability of the BL Lacertae Object PKS 2155–304: Power Spectrum and Cross-Correlation Analysis. *G. Tagliaferri, L. Stella, L. Maraschi, A. Treves, & A. Celotti.* 380, 78, 177-A5 (1991)
- Search for Starbursts among X-Ray-selected Galaxies: Optical Spectroscopy. *Antonella Fruscione & Richard E. Griffiths.* 380, L13, 181-C1 (1991)
- X-Ray Observations of the Seyfert 1 Galaxy Markarian 464. *L. Piro, G. Mai, E. Costa, D. Dal Fiume, F. Frontera, & E. Morelli.* 380, 357, 182-F9 (1991)
- Interaction of Mass Lost in Globular Clusters with the Halo Medium. *D. J. Faulkner & Graeme H. Smith.* 380, 441, 183-F7 (1991)
- The Diffuse Soft X-Ray Background As Seen with the Einstein Observatory. *G. Micela, F. R. Harnden, Jr., R. Rosner, S. Sciotino, & G. S. Vaiana.* 380, 495, 184-D1 (1991)
- X-Ray Emission from Starburst Galaxies. *Yoel Rephaeli, Duane Gruber, Massimo Persic, & Dan MacDonald.* 380, L59, 188-C1 (1991)
- Direct Evidence for Stellar Wind X-Ray Absorption in O Stars. *Wayne L. Waldron.* 382, 603, 209-A9 (1991)
- The Coronal Dividing Line in the ROSAT X-Ray All-Sky Survey. *Bernhard Haisch, J. H. M. M. Schmitt, & C. Rosso.* 383, L15, 219-C1 (1991)
- Relativistic Enhancement of the Compton-reflected Component in Active Galactic Nuclei. *R. D. Rogers.* 383, 550, 221-B4 (1991)
- Three Spectral States of 1E 1740.7–2942: From Standard Cygnus X-1 Type Spectrum to the Evidence of Electron-Positron Annihilation Feature. *R. Sunyaev, E. Churazov, M. Gilfanov, M. Pavlinsky, S. Grebenev, G. Babayan, I. Dekhanov, N. Khavenson, L. Bouche, P. Mandrou, J. P. Roques, G. Vedrenne, B. Cordier, A. Goldwurm, F. Lebrun, & J. Paul.* 383, L49, 226-C6 (1991)
- X-Ray and Radio Pulse Phase Comparison for PSR 1509–58. *N. Kawai, R. Okuyasu, W. Brinkmann, R. Manchester, A. G. Lyne, & N. D'Amico.* 383, L65, 226-D12 (1991)
- X-RAYS: SPECTRA**
- Ginga Observations of Three X-Ray-luminous Galaxies: NGC 4472, NGC 4636, and NGC 3998. *H. Awaki, K. Koyama, H. Kunieda, S. Takano, Y. Tawara, & T. Ohashi.* 366, 88, 2-B8 (1991)
- A New X-Ray Pulsar GS 2138+56 (Cepheus X-4). *Katsuji Koyama, Mitsunobu Kawada, Yuzuru Tawara, Kazuhiro Kimura, Shunji Kitamoto, Sigenori Miyamoto, Hiroshi Tsunemi, Ken Ebisawa, & Fumiaki Nagase.* 366, L19, 6-C5 (1991)
- "Superlow-State" Hard X-Ray Observation of Cygnus X-1. *P. Ubertini, A. Buzzano, F. Perotti, E. Quadrini, A. Cour, A. J. Dean, N. Dipper, R. Lewis, L. Bassani, & J. B. Stephen.* 366, 544, 9-G1 (1991)
- X-Ray Continuum and Evidence for an Iron Emission Line from the Quasar E1821+643. *T. Kii, O. R. Williams, T. Ohashi, H. Awaki, K. Hayashida, H. Inoue, H. Kondo, K. Koyama, F. Makino, K. Makishima, R. D. Sexton, G. C. Stewart, S. Takano, Y. Tanaka, & M. J. L. Turner.* 367, 455, 19-A11 (1991)
- Fe XII Line Ratios in Solar Flares. *S. S. Tayal, Ronald J. W. Henry, F. P. Keenan, S. M. McCann, & K. G. Widing.* 369, 567, 44-G1 (1991)
- A Ubiquitous Absorption Feature in the X-Ray Spectra of BL Lacertae Objects. *Greg M. Madejski, Richard F. Mushotzky, Kimberly A. Weaver, Keith A. Arnaud, & C. Megan Urry.* 370, 198, 49-F1 (1991)
- Discovery of 111 Second Pulsation from the X-Ray Source Scutum X-1. *K. Koyama, H. Kunieda, Y. Takeuchi, & Y. Tawara.* 370, L77, 59-D1 (1991)
- Spectral Observations of the Extreme Ultraviolet Background. *Simon E. Labov & Stuart Bowyer.* 371, 810, 71-F1 (1991)
- X-Ray Luminosity and Spectral Variability in the Seyfert Type 1 Galaxy: PG 2130+099. *K. P. Singh, A. R. Rao, & M. N. Vahia.* 372, 49, 74-E13 (1991)
- Magnetic Two-Photon Scattering and Two-Photon Emission: Cross Sections and Redistribution Functions. *S. G. Alexander & P. Mészáros.* 372, 554, 82-E11 (1991)
- Cyclotron Harmonics in Accreting Pulsars and Gamma-Ray Bursters: Effect of Two-Photon Processes. *S. G. Alexander & P. Mészáros.* 372, 565, 82-F9 (1991)
- Hard X-Ray Spectra from Gap Accretion onto Neutron Stars. *Włodzimierz Kłuzniak & James R. Wilson.* 372, L87, 85-E1 (1991)
- The Energies and Structure of X-Ray K-Absorption Edges. *Robert J. Gould & Young-Dae Jung.* 373, 271, 89-D1 (1991)
- HEAO 1 A-2 Low-Energy Detector X-Ray Spectra of the Lupus Loop and SN 1006. *D. A. Leahy, J. Nosek, & A. J. S. Hamilton.* 374, 218, 100-G1 (1991)
- Coronal Dynamics of a Quiescent Active Region. *Julia L. R. Saba & Keith T. Strong.* 375, 789, 122-D9 (1991)
- Cyclotron Line Features in the Spectrum of the Transient X-Ray Pulsar X0115+634. *F. Nagase, T. Dotani, Y. Tanaka, K. Makishima, T. Mihara, T. Sakao, H. Tsunemi, S. Kitamoto, K. Tamura, A. Yoshida, & H. Nakamura.* 375, L49, 124-B11 (1991)
- Line Profiles from a Disk around a Rotating Black Hole. *Ari Laor.* 376, 90, 126-B1 (1991)
- The X-Ray Properties of GX 301–2 (4U 1223–62). *F. Haberl.* 376, 245, 128-A5 (1991)
- SMM/HXRBS Observations of Cygnus X-1 from 1986 December to 1988 April. *R. A. Schwartz, L. E. Orwig, B. R. Dennis, J. C. Ling, & W. A. Wheaton.* 376, 312, 128-G1 (1991)
- X-Ray Observations of the Bright Seyfert Galaxy IC 4329A. *K. P. Singh, A. R. Rao, & M. N. Vahia.* 377, 417, 145-A1 (1991)
- The Einstein Objective Grating Spectrometer Survey of Galactic Binary X-Ray Sources. *S. D. Vrilek, J. E. McClintock, F. D. Seward, S. M. Kahn, & B. J. Wargelin.* 76, 1127, 41-C1 (1991)
- Origin of Cosmic X-Ray Background Radiation. *Nobuo Terasawa.* 378, L11, 157-B8 (1991)
- Persistence and Change in the Soft X-Ray Spectrum of the Quasar PG 1211+143. *Martin Elvis, P. Giommi, Belinda J. Wilkes, & Jonathan McDowell.* 378, 537, 159-B1 (1991)
- Discovery of a Cyclotron Resonance Feature at 30 keV from the Transient X-Ray Pulsar Cepheus X-4. *T. Mihara, K. Makishima, S. Kamijo, T. Ohashi, F. Nagase, Y. Tanaka, & K. Koyama.* 379, L61, 175-C6 (1991)

- X-Ray Observations of the Seyfert 1 Galaxy Markarian 464. *L. Piro, G. Matt, E. Costa, D. Dal Fiume, F. Frontera, & E. Morelli.* 380, 357, 182-F9 (1991)
- Radiative Widths and Splitting of Cyclotron Lines in Superstrong Magnetic Fields. *G. G. Pavlov, V. G. Bezchastnov, P. Mészáros, & S. G. Alexander.* 380, 541, 185-A1 (1991)
- A Two-Phase Model for the X-Ray Emission from Seyfert Galaxies. *F. Haardt & L. Maraschi.* 380, L51, 188-B6 (1991)
- Polarization Properties of Emission Lines from Relativistic Accretion Disks. *Kaiyou Chen & Douglas M. Eardley.* 382, 125, 201-F10 (1991)
- Multifrequency Observations of BL Lacertae in 1988. *N. Kawai, M. Matsuoka, J. N. Bregman, H. D. Aller, M. F. Aller, P. A. Hughes, S. A. Balbus, T. J. Balonek, K. C. Chambers, R. E. S. Clegg, S. D. Clements, R. J. Leacock, A. G. Smith, R. Goodrich, J. S. Miller, M. Hereld, M. G. Hoare, V. A. Hughes, G. K. Miley, G. H. Moriarty-Schieven, K. Mathews, G. Neugebauer, T. Ohashi, P. F. Roche, H. A. Thronson, E. Valtaoja, H. Terasranta, J. R. Webb, B. J. Wills, & D. Wills.* 382, 508, 207-G8 (1991)
- Low-Flux Hard X-Ray Observation of Cygnus X-1. *P. Ubertini, A. Bazzano, C. La Padula, R. K. Manchanda, V. F. Polcaro, R. Staubert, E. Kendziorra, & F. Perotti.* 383, 263, 215-D9 (1991)
- X-Ray Variability of GX 339-4 in Its Very High State. *Sigenori Miyamoto, Kazuhiro Kimura, Shunji Kitamoto, Tadayasu Dotani, & Ken Ebisawa.* 383, 784, 224-A3 (1991)
- ZEEMAN EFFECT**
- On the Inference of Magnetic Field Vectors from Stokes Profiles. *John T. Jefferies & Donald L. Mickey.* 372, 694, 84-C9 (1991)
- Vector Magnetic Fields in Sunspots. I. Stokes Profile Analysis Using the Marshall Space Flight Center Magnetograph. *K. S. Balasubramaniam & E. A. West.* 382, 699, 210-C11 (1991)
- ZODIACAL LIGHT**
- Zodiacal Emission. II. Dust near the Ecliptic. *William T. Reach.* 369, 529, 44-C13 (1991)
- Spatial Distribution of the Interplanetary Dust Deduced by Infrared Observations. *P. de Bernardis, F. Feminella, & G. Moreno.* 370, 396, 52-B10 (1991)